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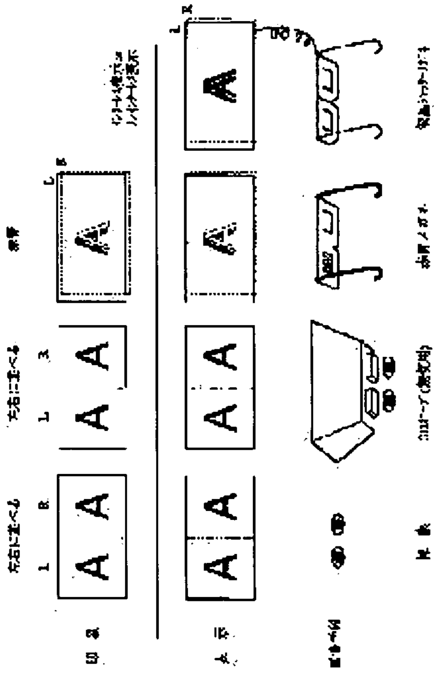
(54) STEREOSCOPIC IMAGE PHOTOGRAPHING ADAPTOR, STEREOSCOPIC IMAGE PHOTOGRAPHING CAMERA, AND STEREOSCOPIC IMAGE PROCESSOR

(57)Abstract:
PROBLEM TO BE SOLVED: To solve the problem that methods of plural kinds are available for stereoscopic vision and each have both advantages and disadvantages, and in the case of, for example, opening an stereoscopic image to public through the Internet, the kind of method for stereoscopic vision employed by a terminal accessing the stereoscopic image cannot be known in advance, and consequently, the layout and the display method of the image cannot decided.
SOLUTION: In the case of displaying a left image photographed by a viewpoint of a left eye and a right image photographed by a viewpoint of a right eye, which of modes as a naked eye stereoscopic vision mode, a 3D scope mode, a 2-color eyeglasses mode, and a liquid crystal shutter eyeglass mode is selected is discriminated, the layout, the color and the switching system are set in matching with the selected mode and the result is displayed on a display device. Thus, a user conducts stereoscopic vision in matching with an apparatus and the capability of the user.



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CLAIMS

[Claim(s)]
[Claim 1] The stereo image photography adapter which is an adapter attached in a camera and equipped the left end or right end of an image which a camera photos with the key which copies a mark image.
[Claim 2] Said camera base is a stereo image photography adapter by which it has the camera base which slides on this slide rail and slide rail top, and a camera is attached in the direction of a right angle to said slide rail.
[Claim 3] The stereo image photography adapter [equipped with the key which copies a mark image at the left end of the image which the camera attached in this camera base photos when said camera base moves to the left end of a slide rail] according to claim 2.
[Claim 4] The stereo image photography adapter [equipped with the key which copies a mark image at the right end of the image which the camera attached in this camera base photos when said camera base moves to the right end of a slide rail] according to claim 2 or 3.
[Claim 5] The camera for stereo image photography which records the purport whose image photoed by ON of this shutter is the left image or right image of a stereo when a shutter is turned on, where it had the handler which inputs that they are a left image or a right image and this handler is operated.
[Claim 6] The camera for stereo image photography which records the purport whose image photoed by ON of this shutter is a right image of a stereo when the purport whose image photoed by ON of this shutter is a left image of a stereo when right and left of a case are equipped with a shutter, respectively and a left-hand side shutter is turned on is recorded and a right-hand side shutter is turned on.
[Claim 7] The camera for stereo image photography which records the purport whose image photoed by ON of this shutter is the left image or right image of a stereo when a shutter is turned on in the condition that equipped the tooth-back right-hand side of a case with the body detection sensor, and this body detection sensor has detected the body.
[Claim 8] The stereo image photography adapter equipped with the slide rail, the left camera base fixed on this slide rail, the right camera base which slides on the slide rail top on the right-hand side of this left camera base, and a simultaneous shutter-on means to turn on simultaneously the shutter of two cameras attached in this left camera ******** camera base.
[Claim 9] Said simultaneous shutter-on means is a stereo image photography adapter according to claim 8 which is the reflecting plate which carries out ON light of the light of infrared remote control which operates the shutter of said camera by RIMOTO to said two cameras simultaneously.
[Claim 10] Said simultaneous shutter-on means is a stereo image photography adapter according to claim 8 which has the shutter queue which contacts the shutter carbon button of both cameras, and the depression device which depresses this shutter queue simultaneously.
[Claim 11] Claim 8 equipped with the key which copies a mark image at the left end of the image which the camera attached in said left camera base photos, a stereo image photography adapter according to claim 9 or 10.
[Claim 12] The stereo image photography adapter [equipped with the key which copies a mark

image at the right end of the image which the camera attached in this camera base photos when said right camera base moves to the right end of a slide rail] according to claim 8 to 11.
[Claim 13] The camera for stereo image photography equipped with a shutter means to direct photography of an image simultaneously to the camera section of the right and left which have a lens and an image pick-up means, and the camera section of these right and left, and a spacing accommodation means to change spacing of the camera section of said right and left.
[Claim 14] Said spacing accommodation means is a camera for stereo image photography including the hinge device in which the camera section on either side is connected according to claim 13.
[Claim 15] Said spacing accommodation means is a camera for stereo image photography including the sliding device to which the camera section of another side is horizontally moved to one camera section according to claim 13.
[Claim 16] Claim 13 equipped with a playback means to display the image which the camera section of said right and left photoed simultaneously on said finder display while having the finder display of each right and left which display the image which is carrying out incidence to the camera section of said right and left on real time, the camera for stereo image photography according to claim 14 or 15.
[Claim 17] The stereo image processing system equipped with a judgment means to judge the image data by which a mark image is copied at a left end or a right end among two or more image data to be the left image or right image of a stereo.
[Claim 18] The stereo image processing system equipped with a stereo image supply means to supply the stereo image which consists of an image on either side, an output mode selection means to choose the output mode of this stereo image, and an output means to output said stereo image by the selected output mode.
[Claim 19] The naked eye stereoscopic vision mode in which the output mode of said stereo image outputs an image on either side at intervals of human being's both eyes, 3D scope mode which outputs an image on either side to the location doubled with 3D scope which carries out incidence of the separate image to right and left, 2 prejudice mode which outputs an image on either side in piles with the image drawn in the separate color, And the stereo image processing system according to claim 18 which is in all or a part of shutter glasses modes which outputs the signal which switched the image on either side by turns under at intervals of the time amount in which human being's perception is possible, displayed it, and synchronized with the switch of this display.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the stereo image processing system which made stereoscopic vision possible using the stereo image photography adapter, the camera for stereo image photography, and stereo image for photoing the stereo image for carrying out stereoscopic vision in false.
[0002]
[Description of the Prior Art] In the business using the Internet, and the so-called e-commerce, since goods cannot be actually taken in their hand, it is dramatically effective to carry out stereoscopic vision of the goods on a screen. And the approach and such an image which carry out stereoscopic vision in false using a plane image are proposed variously conventionally. The image of two sheets seen from the viewing angle of :right and left is juxtaposed. A user the image of a right visual field for example, by the right eye The image of two sheets seen from the viewing angle of the naked eye stereoscopic vision right and left which carry out stereoscopic vision by their capacity by seeing the image of a left visual field by the left eye is juxtaposed. The image data seen from the viewing angle of the stereoscopic vision right and left using 3D scope which leads the image of a right visual field to a right eye, and leads the image of a left visual field to a left visual field is used as red and a blue image by the predetermined operation using a mirror etc., respectively. The image data of the viewing angle of 2 prejudice stereoscopic vision right and left the lens whose user is right and left hangs and appreciates the glasses of blue and red (red of said twice as many blue thickness as this), respectively is switched and expressed as the period of about 10ms. Synchronizing with this display change-over, there is liquid crystal glasses stereoscopic vision which sees right and left with the liquid crystal glasses which open and close a visual field, and there are the advantage and demerit, respectively.
[0003] Although stereoscopic vision is [liquid crystal glasses stereoscopic vision] most automatically possible, the liquid crystal glasses which the liquid crystal shutter attached are required for right and left, the function in which the personal computer which displays an image also controls this is required, and if it is not a high-class system, this stereoscopic vision will not be made. Moreover, although the stereoscopic vision by 2 prejudice could also be easily seen also by whom, since the color of a lens on either side was a color from which complementary color-related differs, there was a fault that prolonged appreciation became color display hard to see severely. Although 3D scope could carry out stereoscopic vision of a color by the comparatively simple system, unlike glasses, there was a fault that a visual field was narrow. Moreover, although it is the simplest since naked eye stereoscopic vision does not need an instrument, in being able to see only a small image, the part by a user's capacity can carry out stereoscopic vision of anyone greatly.
[0004]
[Problem(s) to be Solved by the Invention] the above -- like, when there were merits and demerits, respectively, for example, a solid image was exhibited through the Internet, the approach of two or more kinds of stereoscopic vision could not know beforehand by what kind of method the terminal which accesses this would carry out stereoscopic vision, but had the

trouble that neither the layout of an image nor the method of presentation of an image could be determined.

[0005] Moreover, although stereoscopic vision needs the image of a viewing angle on either side, the image of these right and left is photoed by two points level to accuracy, and it is the conditions of exact stereoscopic vision that they are the same field angle and the same scale factor. However, there was a case where it was difficult to realize this with the usual camera put in practical use conventionally, and it difficult to judge which is the image of right and left of a stereo among two or more photoed images later. Moreover, it was difficult to attach the strength of a cubic effect at the time of photography in many cases.

[0006] This invention aims at offering the stereo image photography adapter which can photo an exact stereo image, the camera for stereo image photography, and the stereo image processing system which made stereoscopic vision possible by various methods.

[0007]

[Means for Solving the Problem] The stereo image photography adapter of this invention is an adapter attached in a camera, and is characterized by equipping the left end or right end of an image which a camera photos with the key which copies a mark image. The stereo image photography adapter of this invention is equipped with the camera base which slides on this slide rail and slide rail top, and said camera base is characterized by attaching a camera in the direction of a right angle to said slide rail. In said invention, the stereo image photography adapter of this invention is characterized by having the key which copies a mark image at the left end of the image which the camera attached in this camera base photos, when said camera base moves to the left end of a slide rail. In said invention, the stereo image photography adapter of this invention is characterized by having the key which copies a mark image at the right end of the image which the camera attached in this camera base photos, when said camera base moves to the right end of a slide rail.

[0008] In the above-mentioned invention, it is constituted [whose a key is] like the rod which projects on the lens (visual field) of a camera. By copying this at an image left end or a right end, a user can judge easily whether it is the left image of a stereo image, or it is a right image, and automatic discernment processing also becomes easy. Moreover, the stereo image of the same direction can be certainly photoed now in the same height by having made it slide a camera on right and left on a slide rail. In addition, even if it reverses right and left in the above-mentioned invention, it is the same configuration, and the same effectiveness can be done so. Therefore, invention which reversed right and left of the above-mentioned invention is also substantially the same as that of the above-mentioned invention, and is included in the technical range of this application above-mentioned invention.

[0009] It has the handler which inputs that the camera for stereo image photography of this invention is a left image or a right image, and where this handler is operated, when a shutter is turned on, the image photoed by ON of this shutter is characterized by recording the purport which is the left image or right image of a stereo. It is characterized by the camera for stereo image photography of this invention recording the purport whose image photoed by ON of this shutter is a right image of a stereo, when the purport whose image photoed by ON of this shutter is a left image of a stereo when right and left of a case are equipped with a shutter, respectively and a left-hand side shutter is turned on is recorded and a right-hand side shutter is turned on. It is characterized by the camera for stereo image photography of this invention recording the purport whose image photoed by ON of this shutter is the left image or right image of a stereo, when a shutter is turned on in the condition that equipped the tooth-back right-hand side of a case with the body detection sensor, and this body detection sensor has detected the body.

[0010] In this invention, it identifies whether the photoed image is a right image or it is a left image by making a user do another actuation in the time of photoing the time of photoing the left image of a stereo image, and a right image. That is, a left shutter is made to turn on or it makes a handler operate it, when photoing a left image. Moreover, a finder is looked into and a photograph is made to take by the eye of respectively right and left of an image on either side. It will be detected by the body detection sensor by which a face moves to the right relatively and is prepared in the right-hand side of a case if a finder is looked into by the left eye. By the above-mentioned actuation, it is identified that the image then photoed is a left image. In addition, even if it reverses right and left in the above-mentioned invention, it is the same configuration, and the same effectiveness can be done so. Therefore, invention which reversed right and left of the above-mentioned invention is also substantially the same as that of the above-mentioned invention, and is included in the technical range of this application above-mentioned invention.

[0011] The stereo image photography adapter of this invention is characterized by having a simultaneous shutter-on means to turn on simultaneously the shutter of the camera attached in the slide rail, the left camera base fixed on this slide rail, the right camera base which slides on the slide rail top on the right-hand side of this left camera base, and this left and a right camera base.

[0012] The stereo image photography adapter of this invention is characterized by said simultaneous shutter-on means being a reflecting plate which carries out ON light of the light of infrared remote control which operates the shutter of said camera by RIMOTO to said two cameras simultaneously in said invention. The stereo image photography adapter of this invention is characterized by said simultaneous shutter-on means having the shutter queue which contacts the shutter carbon button of both cameras, and the depression device which depresses this shutter queue simultaneously in said invention. The stereo image photography adapter of this invention is characterized by having the key which copies a mark image at the left end of the image which the camera attached in said left camera base photos in said invention. In said invention, the stereo image photography adapter of this invention is characterized by having the key which copies a mark image at the right end of the image which the camera attached in this camera base photos, when said right camera base moves to the right end of a slide rail.

[0013] In the above-mentioned invention, it is constituted [whose a key is] like the rod which projects on the lens (visual field) of a camera. By copying this at an image left end or a right end, a user can judge easily whether it is the left image of a stereo image, or it is a right image, and automatic discernment processing also becomes easy. Moreover, by having made it slide a right camera on right and left on a slide rail, spacing with a left image can be changed, two or more right images can be photoed, and the same direction and two or more kinds of stereo images of the same height can be obtained, adjusting the strength of a cubic effect. In addition, even if it reverses right and left in the above-mentioned invention, it is the same configuration, and the same effectiveness can be done so. Therefore, invention which reversed right and left of the above-mentioned invention is also substantially the same as that of the above-mentioned invention, and is included in the technical range of this application above-mentioned invention.

[0014] The camera for stereo image photography of this invention is characterized by having a shutter means to direct photography of an image simultaneously to the camera section of the right and left which have a lens and an image pick-up means, and the camera section of these right and left, and a spacing accommodation means to change spacing of the camera section of said right and left. The camera for stereo image photography of this invention is characterized by said spacing accommodation means including the hinge device in which the camera section on either side is connected in said invention. The camera for stereo image photography of this invention is characterized by said spacing accommodation means including the sliding device moved to the camera section horizontal of another side to one camera section in said invention. In said invention, the camera for stereo image photography of this invention is characterized by having a playback means to display the image which the camera section of said right and left photoed simultaneously on said finder display while it is equipped with the finder display of each right and left which display the image which is carrying out incidence to the camera section of said right and left on real time.

[0015] In this invention, it made it possible to photo the image of right and left of a stereo simultaneously by having prepared the camera section on either side. And the cubic effect of the photoed stereo image can be adjusted by adjusting spacing of the camera section on either side with a spacing accommodation means. Moreover, by having prepared the finder display on either

side, stereoscopic vision of the image which is carrying out incidence to the camera on either side then can be carried out to real time, and the image to photo can be determined exactly. Moreover, it also becomes possible to carry out stereoscopic vision of the image [finishing / photography], and to check it by displaying the already photoed image on this finder display.
[0016] The stereo image processing system of this invention is characterized by having a judgment means to judge the image data by which a mark image is copied at a left end or a right end among two or more image data to be the left image or right image of a stereo. The stereo image processing system of this invention is characterized by having a stereo image supply means to supply the stereo image which consists of an image on either side, an output mode selection means to choose the output mode of this stereo image, and an output means to output said stereo image by the selected output mode. The stereo image processing system of this invention is set to said invention. The output mode of said stereo image The naked eye stereoscopic vision mode which outputs an image on either side at intervals of human being's both eyes, 3D scope mode which outputs an image on either side to the location doubled with 3D scope which carries out incidence of the separate image to right and left, 2 prejudice mode which outputs an image on either side in piles with the image drawn in the separate color, And an image on either side is switched by turns under at intervals of the time amount in which human being's perception is possible, and is displayed, and it is characterized by being in all or a part of shutter glasses modes which outputs the signal which synchronized with the switch of this display.
[0017] In this invention, the image by which stereo photography was carried out is captured and the output for decision on either side and stereoscopic vision is performed. Here, an output includes saving as a display on a display, print-out, and an image file for stereoscopic vision.
[0018]
[Embodiment of the Invention] Drawing 1 is the external view of the left image discernment adapter which is the operation gestalt of this invention. This left image discernment adapter is for copying the key mark of the purport which is a left image to an image file, when photoing the left image which is used when photoing a stereo image, and is photoed from the view of a left eye. A stereo image is a group image which consists of a left image for the above-mentioned left eyes, and a right image for right eyes. The left image discernment adapter 10 consists of cellular level 16 which detects the hinge fitting 15 which connects the key 14 and key 14 which copy a mark image, and the L metallic ornaments 12 to the screw 13 which connects the I metallic ornaments 11 which carried out I-shape, the L metallic ornaments 12 which carried out L typeface, the I metallic ornaments 11, and the L metallic ornaments 12, and a camera, this adapter, and a camera horizontal. Slot 11a is established by the I metallic ornaments 11 at the longitudinal direction, and the screw (un-illustrating) screwed in this slot 11a in the screw hole for tripods of said screw 13 and a camera (un-illustrating) has penetrated. Since [of the longitudinal direction of the I metallic ornaments 11] it is mostly established over the whole, slot 11a of the fixed position of a camera and the L metallic ornaments 12 is free. Moreover, Slots 12c and 12d are established by vertical section 12a and horizontal level 12b of the L metallic ornaments 12, and said screw has penetrated 12d of slots of horizontal level 12b. Since [of horizontal level 12b] it is mostly established over the whole region, 12d of slots of the location at which the L metallic ornaments 12 cross the I metallic ornaments 11 is free. It is fixed to slot 12c of vertical section 12a, and a hinge fitting 14 is rockable 90 degrees while it supports a long and slender cylindrical key. The L metallic ornaments 12 and a hinge can move a key 14 in front of the lens of a camera, or can be removed from before a lens. In consideration of the magnitude and balance of a camera, a user fixes a camera and the L character metallic ornaments 12 with screws to the suitable part of slot 11a, adjusts the fixed position of a hinge 15, and the fixed position of a key 14, and it is made to require the point of a key 14 for the left end of the lens of a camera. If it is a digital camera and a digital camcorder equipped with the liquid crystal display, the location of a key can be checked with the image reflected to this liquid crystal display.
[0019] When a user photos the stereo group image for stereoscopic vision using one camera, and photoing said key 14 as it starts in front of a lens when photoing a left image and photoing a right image although sequential photography of a left image and the right image is carried out,

said key 14 is rotated at a view, and as the point of a key 14 does not start a lens, it photos a hinge 15. Thereby, like the image on the left-hand side of drawing 5 (D), a mark is copied at the left end of an image, and discernment of an image on either side becomes easy.
[0020] In addition, this left image discernment adapter 10 may be used by stock photography, and may be used for the photography fixed to the tripod etc. Moreover, it is also possible by attaching a camera in this left discernment adapter 10, fixing to a tripod, fixing to another tripod and installing another camera in the right-hand side of said camera to carry out stereo photography simultaneously using two cameras.
[0021] Next, the slide type photography adapter which are other operation gestalten of this invention is shown in drawing 2 . This slide type photography adapter can photo an image on either side by making a camera slide. In this drawing, this slide type photography adapter 20 fits in this slide rail 21, enabling the slide rail 21 installed in bearing of the exposure axis by the right angle, and free sliding, and has the fixed part 25 for fixing to a tripod the end pieces 23 and 24 and slide rail of the right and left prepared in the ends of the camera base 22 where a camera is fixed, and the slide rail 21. It is fixed to the ends of the slide rail 21, and he is trying for the camera base 22 not to separate from end pieces 23 and 24 from the slide rail 21. On the camera base 22 and the left-hand side end piece 23, the I metallic ornaments 11 (refer to drawing 1) are attached, and a camera or the L metallic ornaments 12 can be attached now on this. Moreover, the cellular level 16 is formed in the I metallic ornaments 11 formed on the end piece 23, and it can judge whether this slide type photography adapter is installed horizontally.
[0022] A camera is attached in slot 11a of the I metallic ornaments 11 on the camera base 22. And make it move to the left end of the slide rail 21, and photo a left image, it is made to move to the predetermined die-length right, and a right image is photoed. The number of right images one, and they may change spacing with the camera station of a left image, and may photo it two or more sheets.
[0023] Drawing 3 shows the operation gestalt which formed the key 14 for left image discernment to the slide type photography adapter of drawing 2 . In this drawing, a screw 13 is used for the I metallic ornaments 11 attached on the left end piece 23, and the key 14 is fixed to vertical section 12a of installation and these L metallic ornaments 12 for the L metallic ornaments 12. By forming this key 14 so that the lens of the camera of the location which photos a left image may be started, a mark can be copied in the left end section of a left image, and discernment becomes easy.
[0024] In addition, in drawing 2 and the slide type photography adapter of drawing 3 , the group image which consists of a left image of one sheet and a right image of one sheet is called pair image, and the group image which consists of a left image of one sheet and a right image of two or more sheets which distance was changed and photoed it from the view of this left image is called series image. When a sense of distance and cubic effect when carrying out stereoscopic vision will want to change since a sense of distance and a cubic effect change if the distance of the view of a left image and a right image changes, this photos two or more right images, and appreciates this with a switch.
[0025] in this case, having carried out the optical axis in parallel, as shown in drawing 4 (A) -- the image of two or more sheets -- a photograph may be taken (the look has always turned to infinite distance in this case) -- as shown in this drawing (B), a look is turned for a specific object and you may make it change the sense of a camera Although this may change whenever [setting-angle / of a camera] and the sense of a camera may be changed, a camera base is constituted in a rotatable thing and you may make it change the sense of a camera by rotating a camera base. About a pivotable camera base, it mentions later.
[0026] Here, the method of the array of the image file group of the series image which consists of the left image of one sheet, the pair image which consists of a right image of one sheet and a left image of one sheet, and a right image of two or more sheets is explained with reference to drawing 5 . This drawing (A) shows the example of the array of a common pair image, and this drawing (B) is drawing showing the example of the array of a common series image. In the array of such an image, since either understands neither the break of a group image, nor a left image, it is necessary to compare and determine the content. The start point of a left image and a

group image can be easily judged by on the other hand copying a mark in a left image like the pair image of this drawing (D) and (I), or the series image of this drawing (E) - (H). In addition, in this drawing, (C) and the black image file of (E) - (H) are image files showing the break (termination or initiation) of a series image, and can be created by in the case of a camera (digital camera), carrying out the mask of the lens and photoing it. That is, when finishing photoing a series image, or before photoing a series image, the break of a series image can be easily judged by carrying out mask photography and creating the black image file. Moreover, a mark is copied also at the right end of the right image of this drawing (G) - (H). This prepares and photos a key 14 also to the right-hand side end piece 24, as shown in drawing 6 . By this, a left-hand side key image is copied by the left image, a right-hand side key image is copied by the right image, and discernment becomes easy. Moreover, in the case of a series image, since a key is copied by a left image and the right end right image, respectively, the beginning of series and the last are intelligible.

[0027] In drawing 6 , this slide type photography adapter shows the operation gestalt which formed the right-hand side key 14 further to the slide type photography adapter of drawing 3 . Since the mounting device of the right-hand side key 14 is the left-hand side mounting device and the bilateral symmetry of a key, it omits explanation.

[0028] Although the above-mentioned operation gestalt showed the adapter used when moving one camera to the right and photoing an image on either side as a separate image file, the adapter which attaches next the stereo adapter which copies an image on either side to one image file, and two cameras, and photos an image file on either side simultaneously is explained.

[0029] Drawing 7 is drawing showing the stereo adapter for ocellus cameras which copies a right-and-left image to one image file. This stereo adapter 30 for ocellus cameras fixes the L metallic ornaments 12 and a camera (un-illustrating) on the I metallic ornaments 11 like the adapter of drawing 1 . The stereo mirror 31 is attached in vertical section 12a of L metallic ornaments through fixing metal 32. The stereo mirror 30 is an optical instrument to which the area of the right and left which built a mirror and prism in the interior and divided the image sensor into two equally horizontally is made to carry out image formation of the image on either side independently. The image on either side is separated about 6cm. The image file photoed using this stereo adapter 30 for ocellus cameras becomes like drawing 5 (J), and serves as a pair image of a stereo by one sheet. In addition, the cellular level 16 is formed in the back end section of the I metallic ornaments 11.

[0030] Moreover, drawing 8 shows the example which used as the hinge fitting 33 fixing metal which attaches the stereo mirror 31 in vertical section 12a in the above-mentioned stereo adapter 30 for ocellus cameras. The stereo mirror 31 can be rotated a maximum of 270 degrees centering on a hinge fitting 33, and also at the time of the usual photography which does not photo a stereo image, without removing a camera from this stereo adapter 30 for ocellus cameras, as the stereo mirror 31 is rotated and the stereo mirror 31 does not start the lens of a camera, the usual photography is enabled.

[0031] Drawing 40 and drawing 41 are drawings showing other operation gestalten of the stereo adapter for ocellus cameras which copies a right-and-left image to one image file. This stereo adapter for ocellus cameras is attached to a camera direct picking using the fixed belt 94 and the fixed metallic ornaments 95. It is fixed to the tripod hole of a camera and the fixed metallic ornaments 95 support the body 90 of an adapter from the bottom to a camera. And with the spring, the fixed belt 94 is rolled round inside a body, has become a formula, lets this out and stops from on a camera to the fixed metallic ornaments 95.

[0032] The body 90 is carrying out the truncated four-sided pyramid configuration, the base is carrying out opening, and the lens of a camera is inserted in the opening. The internal mirrors 92R and 92L of two sheets are formed in the interior of a body 90. The internal mirrors 92R and 92L of two sheets contact in the center of the lens inserted, and are formed in right and left towards the lens with the open angle of 90 degrees. Each internal mirrors 92R and 92L counter at the include angle of 45 degrees towards a lens. The external mirrors 91R and 91L are formed in the both-sides side of a body, and the supporting point supports the hinge formed in the side section of the both sides of said base free [a splash]. At the time of carrying and receipt, these external mirrors 91R and 91L are folded so that the side face of a body 90 may be met. The hook for stopping this mirror on a body 90 is prepared at the head of the external mirrors 91R and 91L. At the time of an activity, the external mirrors 91R and 91L are opened focusing on said hinge. The include angle which opens and is fixed in the condition is an include angle which serves as the internal mirrors 92R and 92L on either side in parallel. Thereby, the image on the right of the core of a camera carries out incidence to the right half of a lens, and the image on the left of the core of a camera carries out incidence to the left half of a lens. Therefore, the image photoed with this camera becomes like drawing 5 (J), and turns into a stereo image on either side by one sheet.

[0033] Drawing 9 is drawing showing a digital camera with a left discernment carbon button. This camera is equipped with the left discernment carbon button 36, and pushes the left discernment carbon button 36 independently [a shutter release 38] at the time of photography of a left image. If a shutter release 38 is pushed where the left discernment carbon button 36 is pushed, left identification information will be automatically added to the image data photoed at this time (record). Moreover, when the left discernment carbon button 36 is pushed, the automatic notice of the left discernment carbon button 36 having been pushed with voice, the lamp in a finder 37, etc. is carried out. Furthermore, when stereo mode is chosen with the mode selection switch 39 and the left discernment carbon button 36 is not pushed, automatic notice that it is a right image is performed. Thereby, the error of employment of a user can be lost. Furthermore, the lamp turned on when a left image is photography settled is formed in FAIDA 37, and it enables it to notify of whether a left image is photography settled at the time of stereo mode.

[0034] Thus, actuation of a user can be further made into a positive thing by equipping the function which it enables it to set up photography modes various with the mode setting switch 39, stereo mode is formed into it, and camera setting out suitable for photography of a stereo image, for example, time-of-day setting out, setting out of various photography conditions, etc. are set automatically, or carries out semi-automatic warning with the lamp in voice and a finder 37 etc. Moreover, a next image processing becomes easy by adding identification information to that effect to the image data photoed in stereo photography mode automatically.

[0035] Moreover, when the liquid crystal display is carried in the camera, the left half of a display is made to display a left image on photography and coincidence of a left image. Right-hand side also makes the right half of a display display a right image on photography and coincidence of a right image similarly. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, by making a display display on right-and-left coincidence, the so-called naked eye stereoscopic vision becomes possible, and there is an advantage that a photography result can be checked immediately. In addition, this drawing (A) shows the type which formed cellular level, and the type with which this drawing (B) formed the electronic level sensor, and the level check at the time of photography becomes easy by having formed an electronic level sensor or cellular level in this way.

[0036] Drawing 10 is drawing showing the digital camera which equipped right and left with the shutter release. This camera has equipped right and left with shutter releases 38R and 38L, and in photoing a left image, when photoing left shutter release 38L and a right image, it turns on right shutter release 38R. A push on a left shutter adds automatically left identification information which shows that it is a left image to the image data then photoed (record). Similarly, a push on a right shutter adds automatically right identification information which shows that it is a right image to the image data then photoed (record). Moreover, when a shutter release on either side overlaps and is turned on, a photograph is not taken, but the automatic notice of this is carried out, and the error of employment of a user is corrected.

[0037] Moreover, this camera can make actuation of a user a positive thing further by equipping the function which it enables it to set up photography modes various with the mode setting switch 39, stereo mode is formed into it, and camera setting out suitable for photography of a stereo image, for example, time-of-day setting out, setting out of various photography conditions, etc. are set automatically, or carries out semi-automatic warning with the lamp in voice and a finder 37 etc. Moreover, the stereo photography mode itself is recorded automatically as additional information.

[0038] Moreover, when the liquid crystal display is carried in the camera, the left half of a display is made to display a left image on photography and coincidence of a left image. Right-hand side also makes the right half of a display display a right image on photography and coincidence of a right image similarly. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, by making a display display on right-and-left coincidence, the so-called naked eye stereoscopic vision becomes possible, and there is an advantage that a photography result can be checked immediately. In addition, this drawing (A) shows the type which formed cellular level, and the type with which this drawing (B) formed the electronic level sensor, and the level check at the time of photography becomes easy by having formed an electronic level sensor or cellular level in this way.
[0039] Drawing 11 is drawing showing the digital camera which equipped the right-hand side of a case with the infrared body sensing sensor 41. The right-hand side of a camera case is equipped with the infrared body sensing sensor 41 with this camera. A user looks into a finder 37 by the right eye at the time of right image photography, and looks into a finder 37 by the left eye at the time of left image photography. If it does so, in looking into a finder 37 by the left eye, it moves to the right relatively to a camera, and a face covers the body sensing sensor 41 and turns on. Left identification information of the purport which is a left image is added to the image file photoed when this body sensing sensor 41 turned on (record). On the contrary, when the body sensing sensor 5 does not sense a body, right identification information of the purport which is a right image is added to the image file then photoed (record).
[0040] Moreover, the arm of the above-mentioned body sensing sensor 41 is stood, and it is made for the sensor section 41 to come to the right-hand side of a camera, as this camera is shown in this drawing (B), in photoing a derrick down and a longwise image horizontally. thus -- even if how to establish a camera by carrying out is different -- right and left -- it is detectable by which eye the finder is looked into, i.e., which shall be photoed between a right image and a left image?.
[0041] Moreover, this camera can make actuation of a user a positive thing further by equipping the function which it enables it to set up photography modes various with the mode setting switch 39, stereo mode is formed into it, and camera setting out suitable for photography of a stereo image, for example, time-of-day setting out, setting out of various photography conditions, etc. are set automatically, or carries out semi-automatic warning with the lamp in voice and a finder 37 etc. Moreover, the stereo photography mode itself is recorded automatically as additional information.
[0042] Moreover, when the liquid crystal display is carried in the camera, the left half of a display is made to display a left image on photography and coincidence of a left image. Right-hand side also makes the right half of a display display a right image on photography and coincidence of a right image similarly. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, by making a display display on right-and-left coincidence, the so-called naked eye stereoscopic vision becomes possible, and there is an advantage that a photography result can be checked immediately. Moreover, if an electronic level sensor or cellular level is formed, the level check at the time of photography will become easy.
[0043] Next, the adapter to be used is explained when carrying out stereo photography using two cameras. Drawing 12 is drawing showing the slide type photography adapter which has attached two ocellus cameras and photos a stereo image simultaneously. In this adapter, the part of the same configuration as the adapter shown in drawing 2 attaches the same number, and omits explanation.
[0044] By this slide type photography adapter, a left end piece is used as the left camera base 23, a left camera is attached here and a right camera is attached in the camera base 22 which can slide an installation and rail 21 top fixed. And the shutter of both cameras is simultaneously depressed with both hands, or using infrared remote control, both cameras are driven simultaneously and photoed. When using infrared remote control, since remote control is operated from back, a reflecting plate 26 is attached ahead of a fixed part 25. This reflecting plate 26 reflects the infrared radiation irradiated from back, and it is made it to carry out ON

light to the infrared light sensing portion of a camera. Moreover, the slide stopper 27 is attached on the rail 21 about 6cm on the right-hand side of the camera base 23. This slide stopper 27 is for regulating so that the right camera base 22 may not approach the left camera base 23 too much.

[0045] Drawing 13 shows the example which formed the left discernment key 14 to the above-mentioned slide type photography adapter. In this drawing, a screw 13 is used for the I metallic ornaments 11 attached on the left camera base 23, and the key 14 is fixed to vertical section 12a of installation and these L metallic ornaments 12 for the L metallic ornaments 12. What is necessary is just to determine suitably the installation location to the L metallic ornaments 12 and the I metallic ornaments 11 of a camera. By preparing so that the lens of the camera which photos the left image in which this key 14 was attached on this left camera base 23 may be started, a mark can be copied in the left end section of a left image, and discernment becomes easy.

[0046] Drawing 14 shows the example which formed the discernment key 14 on either side to the above-mentioned slide type photography adapter. The right discernment key 14 is attached through the I metallic ornaments 11 and the L metallic ornaments 12 on the right end piece 24, and when the right camera base 22 moves to the right, the lens of a right camera is applied at the head of a key 14. Thereby, while discernment of a right image becomes easy, when a series image is photoed, a right end image, i.e., decision of termination of series, becomes easy.

[0047] Drawing 15 (A) and drawing 19 show drawing in which the mechanical simultaneous shutter attachment 50 was formed to the slide type photography adapter of drawing 12 . The simultaneous shutter attachment 50 is carrying out the configuration as shown in drawing 16 , and after making the shutter queue 53 contact the shutter of a camera, it can push the shutter of the camera of both right and left simultaneously by depressing the movable side device section 51 whole.

[0048] In drawing 16 , the simultaneous shutter attachment 50 is the fixed part 25 of the slide type photography adapter 20 from the fixed side device section 52 by which mounting immobilization is carried out, and the movable side device section 51 stopped possible [vertical movement] at this fixed side device section. The fixed side device section 52 has the arm 55 inserted in a fixed part 25, and the stop section 56 which builds in a spring and stops the movable side device section 51. The stop section 56 is energized up with the above-mentioned spring. The movable side device section 51 consists of an arm 61 in which it is attached in the stanchion 60 of the inverted L stopped by said stop section 56, and a stanchion 60, and two or more shutter queue metallic ornaments 62 are attached, and shutter queue metallic ornaments 62 which have the pin-like shutter queue 53 at a head. A stanchion 60, an arm 61, and the shutter queue metallic ornaments 62 have the slot, respectively, and according to the configuration and height of a camera, alignment of them is carried out suitably, and each other are fixed with screws.

[0049] The fixed side device section 52 is beforehand attached in the slide type photography adapter 20 of drawing 12 - drawing 14 . And after attaching a camera on either side in the camera bases 22 and 23 on either side, the movable side device section 51 is put from a top, and the connecting location of each mechanism element is adjusted so that the shutter queue 53 at the head of this movable side device section 51 may come to the shutter location of a camera on either side. After this, if a user depresses the movable side device section 51, the shutter queue 53 at a head will depress the shutter of a camera on either side, and a right-and-left image will be photoed simultaneously.

[0050] In addition, if it is the same camera also as a camera on either side, it is satisfactory, but when it is the camera of a class with which a left camera differs from a right camera, a shutter location may differ from a lens location. In such a case, the height of a lens can be made the same by attaching on a camera base and attaching installation immobilization of the camera for a camera height adjustment attachment as shown in drawing 17 (A) on this. Moreover, when the height of a shutter differs, it enables it to depress the shutter of the camera of two right and left simultaneously by adjusting the height to the arm 61 of the shutter queue metallic ornaments 62 which have the shutter queue 53 as shown in drawing 17 (B).

[0051] Moreover, in toppling a camera horizontally, fixing and photoing a longwise image, the vertical camera mounting attachment 65 as shown in drawing 17 (C) is replaced with the I metallic ornaments 11, and it fixes a camera to installation and this vertical camera mounting attachment 65 sideways on the camera bases 22 and 23. In that case, when setting and using a simultaneous shutter attachment, only the movable side device section 51 is used not using the fixed side device section 52. That is, as shown in drawing 18 and drawing 20 , the projection of the side face of the shutter queue 53 depresses the shutter of a camera simultaneously by inserting the stanchion 60 of the movable side device section 51 in a fixed part 25, making an arm 61 right and left movable by loosening the connection of a stanchion 60 and an arm 61, and moving an arm 61 to the left.

[0052] In addition, the appearance of each part article used for drawing 21 by this slide type photography adapter is shown. This drawing (A) is drawing showing the slide stopper 27. This slide stopper is a stopper for regulating the camera base 22 which can slide the slide rail 21 top on the slide rail 21, and is fixed to a rail 21 by carrying out fitting to the slide rail 21, and tightening the screw of order on it. This drawing (B) is an external view of the I metallic ornaments 11 which are the bottom plates of a camera. The screw screwed in the tripod screw of a camera has fitted into slot 11a. Moreover, this drawing (C) shows what formed the cellular level 16 in the back end section of these I metallic ornaments 11. Moreover, although this drawing (D) is drawing showing the camera base 22 which can slide a rail 21 top, this camera base 22 is rotatable to the pedestal to which the part of the shoe which engages with I metallic ornaments slides on a rail top. Photography of the direction of [except vertical] is also attained at a rail using this.

[0053] The above-mentioned simultaneous shutter attachment 50 is the camera (digital camera (a video camera is included)) by which a shutter can be electronically cut although simultaneous push of a shutter was realized structural, when using that by which the synchronous terminal is prepared outside, as it is shown in drawing 22 , it puts in order and installs these two cameras, and it is synchronized with a cable or infrared radiation, and a shutter can be turned off simultaneously. In addition, when putting two sets in order and arranging, you may arrange and install on a certain base, and a user may have one set at a time in both hands.

[0054] Here, the configuration of the interlocking camera using infrared radiation is explained.

[0055] ** Build an infrared light sensing portion in the left-hand side of the body of a camera, and build an infrared light-emitting part into right-hand side.

** In case two cameras of the above-mentioned ** are put in order and stereo photography is carried out, make it a shutter not turned off only with the camera located in left-hand side.

** If the shutter of a left-hand side camera is pushed lightly, the infrared information which directs the condition synchronization of two cameras will be transmitted to a right-hand side camera from a left-hand side camera. A right-hand side camera receives this information, and is set as the condition that both cameras are the same.

** If the shutter of a left-hand side camera is pushed in further, the information on a purport that a shutter is turned off is transmitted towards a right-hand side camera from a left-hand side camera, and the shutter of two cameras will synchronize, it will be cut, and the stereo image which synchronized will be photoed. In the case of a digital camera, the information which shows a right-hand side image and a left-hand side image to the file name of the photoed image is indicated.

[0056] Even when two cameras are connected by the cable, it is possible to carry out the same linkage as the above.

[0057] ** Include a connector in the body of a camera.

** In case two cameras of the above-mentioned ** are put in order and stereo photography is carried out, connect a connector by the cable and carry out setting out of right-hand side and left-hand side to each camera.

** If the shutter of a left-hand side camera is pushed lightly, the signal which directs the condition synchronization of two cameras will be transmitted to a right-hand side camera from a left-hand side camera. A right-hand side camera receives this signal, and is set as the condition that both cameras are the same.

** If the shutter of a left-hand side camera is pushed in further, the signal of a purport by which a shutter is turned off is transmitted towards a right-hand side camera from a left-hand side camera, and the shutter of two cameras will synchronize, it will be cut, and the stereo image which synchronized will be photoed. In the case of a digital camera, the information which shows a right-hand side image and a left-hand side image to the file name of the photoed image is indicated.

[0058] Moreover, when a digital camera is used, while being able to check the location of the image photoed by displaying in piles the image which two cameras are copying on one finder display, the alignment of two cameras becomes easy.

[0059] The example of 2 eye camera which can photo a stereo image is shown in drawing 23 and drawing 24 . This 2 eye camera 70 includes the camera sections 71 and 72 of the right and left which consist of a lens, an image sensor, a finder, etc. in one cases [two]. Drawing 23 (A) is a perspective view by the side of the transverse plane of this camera, and this drawing (B) is a perspective view by the side of the tooth back of this camera. It is joined by the hinge 73 in the soffit section, and open Lycium chinense grows in the right camera section 71 and the left camera section 72 like drawing 24 (A) focusing on this hinge 73. The include angle to open can be made into the include angle of the arbitration of a between until it opened thoroughly [drawing 24 (A)] from the condition (0 times) closed thoroughly [drawing 23] (180 degrees). The lens of each camera section, an image sensor, a finder, etc. rotate conversely by the open angle within a case, even if the camera section is opened by which include angle, and he is trying to always maintain an erection condition. And lens spacing according to this open angle is memorized by the photoed image file as additional information. Moreover, the left camera section 72 can make it rotate 270 degrees horizontally, as shown in drawing 24 (B).

[0060] It has the stroboscope, the connector for digital analog output, and the level sensor, and also a ** and when open [it closes, and], this camera is equipped [two shutters of **, and] with two tripod holes and photography mode switch of ** when open [it closes, and], a ** and.

[0061] Furthermore, the liquid crystal displays 76 and 77 for a check are formed in the tooth back of a case on either side, the image of the right and left corresponding to the mode at the time of photography can be checked, and it is possible to display image data [finishing / photography] on a naked eye stereoscopic vision display etc. Moreover, the interface which connects the liquid crystal shutter glasses which synchronized with the video output interface of a vertical refresh rate 100 Hertz or more and this may be established.

[0062] This camera can set up the following eight photography modes by switching a photography mode switch.

[0063] normal mode: -- ordinary photography mode stereo concurrency-mode: only using the lens of one eye -- the mode of the mode panorama concurrency-mode:right and left right and left which carry out stereo photography simultaneous [one sheet] each which carries out the panoramic exposure of the one sheet each simultaneously -- In moreover, this case So that whenever [angle-of-coverage / to which it compared the image on either side automatically as lens of one of the two was electric and the neck swing of it could be carried out to right and left, and it fitted the panoramic exposure] can be decided Normal continuous shooting which may be carried out: The mode which carries out continuous shooting of the same location as a high speed using mode stereo continuous-shooting:2 eye which takes a photograph only with one eye and carries out continuous shooting of the same location at intervals of several seconds (it is suitable, when having ridden on mobiles, such as the usual vehicle, and carrying out stereo photography)

Panorama continuous shooting: The mode which carries out panorama continuous shooting of the same location at intervals of several seconds using two eyes (it is suitable when having ridden on the very late mobile, and carrying out stereo photography of a panorama using migration of the view by this migration)

After carrying out a panoramic exposure using panorama 180:2 eye, an one of the two lens case is rotated, and 180 large panorama scenery photography is performed. After carrying out a panoramic exposure using panorama 270:2 eye which may be the device which lens of one of the two rotates automatically [it is electric and], an one of the two lens case is rotated, and 270 large panorama scenery photography is performed. You may be the device which lens of one of the two rotates automatically [it is electric and].

[0064] Moreover, since liquid crystal displays 76 and 77 are formed in the camera section tooth back on either side, the left half of a display is made to display a left image on photography and coincidence of a left image. Right-hand side also makes the right half of a display display a right image on photography and coincidence of a right image similarly. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, by making a display display on right-and-left coincidence, the so-called naked eye stereoscopic vision becomes possible, and there is an advantage that the check of the image before photography and the check of a photography result can be performed immediately. Moreover, the level check at the time of photography becomes easy by establishing level detection means, such as an electronic level sensor and cellular level.

[0065] Drawing 25 and drawing 26 are drawings showing other examples of 2 eye camera which can photo a stereo image. This 2 eye camera 80 equipped the body 81 with the left camera section, and equips with the right camera section another object 82 connected to this body with the rod 83 which can slide. Each camera section consists of the lens, an image sensor, a finder, etc. the part by the side of the transverse plane where drawing 25 (A) shows [the perspective view by the side of the tooth back of this camera, and this drawing (C)] the condition of having contained 2nd stopper 83b of the edge of a rod as for the perspective view by the side of the transverse plane of this camera, and this drawing (B) -- it is a perspective view. It is designed so that the distance of the lens of the left camera section and the right camera section may be set to 6cm which is spacing of human being's both eyes in the condition which shows in drawing 25 . And a rod 83 is slid, the distance of another object 82 and a body 81 is detached, and if it is made to stop in the location where 1st stopper 83a contacts a body 81, the distance of the camera section on either side will become twice (12cm) spacing of both eyes (refer to drawing 26 (A)). Moreover, 2nd stopper 83b which is the thick part prepared in the edge of a rod contacts a wall in the body 81 interior, and if it is made to stop in the place it becomes impossible to pull out more than it, the distance of the camera section on either side will be 3 times (18cm) the spacing of both eyes (refer to drawing 26 (B)). In addition, this can be bent, and although 2nd stopper 83b projects from the side face of a camera in the state of drawing 25 which made another object 82 coalesce in a body 81 (refer to drawing 25 (A)), as shown in this drawing (C), it can contain. And lens spacing according to the die length by which the rod 83 was pulled out by the photoed image file is memorized as additional information. Moreover, the right camera section of another object 82 can make it rotate 360 degrees horizontally, as shown in drawing 26 . In addition, generally, if the distance between lenses on either side is set as 1 / 20 - 1/50 of distance from a photographic subject, a suitable cubic effect can be acquired.

[0066] This camera is equipped with a shutter, the stroboscope, the tripod hole, the connector for digital analog output, and the level sensor, and also it is equipped with the photography mode switch.

[0067] Furthermore, the liquid crystal display 83 for a check is formed in the tooth back of a body 81, the image of the right and left corresponding to the mode at the time of photography can be checked, and it is possible to display image data [finishing / photography] on a naked eye stereoscopic vision display etc. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, there is an advantage that the check of the image before photography and the check of a photography result can be immediately performed by making naked eye stereoscopic vision possible. Moreover, the interface which connects the liquid crystal shutter glasses which synchronized with the video output interface of a vertical refresh rate 100 Hertz or more and this may be established. Moreover, the level check at the time of photography becomes easy by establishing level detection means, such as an electronic level sensor and cellular level.

[0068] This camera can set up the following eight photography modes by switching a photography mode switch.

[0069] normal mode: -- ordinary photography mode stereo concurrency-mode: only using the lens of one eye -- you may enable it to decide whenever [angle-of-coverage / to which it compared the image on either side automatically as lens of one of the two was electric and the neck swing of it could be carried out to right and left, and it fitted the panoramic exposure] in the mode of the mode panorama concurrency-mode:right and left right and left which carry out stereo photography simultaneous [one sheet] each which carries out the panoramic exposure of the one sheet each simultaneously, and this case

[0070] Normal continuous shooting: The mode which carries out continuous shooting of the same location as a high speed using mode stereo continuous-shooting:2 eye which takes a photograph only with one eye and carries out continuous shooting of the same location at intervals of several seconds (it is suitable, when having ridden on mobiles, such as the usual vehicle, and carrying out stereo photography)

Panorama continuous shooting: The mode which carries out panorama continuous shooting of the same location at intervals of several seconds using two eyes (it is suitable when having ridden on the very late mobile, and carrying out stereo photography of a panorama using migration of the view by this migration)

After carrying out a panoramic exposure using panorama 180:2 eye, an one of the two lens case is rotated, and 180 large panorama scenery photography is performed. You may be the device which lens of one of the two rotates automatically [it is electric and].

[0071] After carrying out a panoramic exposure using panorama 360:2 eye, an one of the two lens case is rotated, and 360 large panorama scenery photography is performed (refer to drawing 29). You may be the device which lens of one of the two rotates automatically [it is electric and].

[0072] And camera section (a graphic display left camera section) of one of the two carries out a horizontal revolution 360 degrees a panorama and for stereo photography.

[0073] Moreover, drawing 27 and drawing 28 are drawings showing 2 eye camera which can photo the stereo image of further others. This 2 eye camera 80' is replaced with the rod 83 of 2 eye camera shown in above-mentioned drawing 25 and drawing 26 , and is equipped with two steps of square pipe steel 85. The part of the same configuration as drawing 25 and 2 eye camera of drawing 26 omits explanation. Drawing 27 (A) is a perspective view by the side of the transverse plane of this camera, and this drawing (B) is a perspective view by the side of the tooth back of this camera. It is designed so that the distance of the lens of the left camera section and the right camera section may be set to 6cm which is spacing of human being's both eyes in the condition which shows in drawing 25 . And if one step of square pipe steel 85 is pulled out as shown in drawing 28 (A), the distance of the camera section on either side will become twice (12cm) spacing of both eyes. Furthermore, if two steps of square pipe steel 85 is pulled out as shown in drawing 28 (B), lens spacing according to the die length by which the rod 83 was pulled out by the image file which the distance of the camera section on either side increased 3 times (18cm) of spacing of both eyes, and was photoed will be memorized as additional information. Moreover, the right camera section of another object 82 can make it rotate 360 degrees horizontally, as shown in drawing 26 . In addition, generally, if the distance between lenses on either side is set as 1 / 20 - 1/50 of distance from a photographic subject, a suitable cubic effect can be acquired.

[0074] This camera is equipped with a shutter, a stroboscope, the tripod hole, the connector for digital analog output, the level sensor, and the photography mode switch.

[0075] Furthermore, the liquid crystal display 83 for a check is formed in the tooth back of a body 81, the image of the right and left corresponding to the mode at the time of photography can be checked, and it is possible to display image data [finishing / photography] on a naked eye stereoscopic vision display etc. Moreover, the interface whioh connects the liquid crystal shutter glasses which synchronized with the video output interface of a vertical refresh rate 100 Hertz or more and this may be established.

[0076] This camera can set up the following eight photography modes by switching a photography mode switch.

[0077] normal mode: -- ordinary photography mode stereo concurrency-mode: only using the lens of one eye -- you may enable it to decide whenever [angle-of-coverage / to which it compared the image on either side automatically as lens of one of the two was electric and the neck swing of it could be carried out to right and left, and it fitted the panoramic exposure] in the mode of the mode panorama concurrency-mode:right and left right and left which carry out stereo photography simultaneous [one sheet] each which carries out the panoramic exposure of the one sheet each simultaneously, and this case

[0078] Normal continuous shooting: The mode which carries out continuous shooting of the same location as a high speed using mode stereo continuous-shooting:2 eye which takes a photograph only with one eye and carries out continuous shooting of the same location at intervals of several seconds (it is suitable, when having ridden on mobiles, such as the usual vehicle, and carrying out stereo photography)

Panorama continuous shooting: The mode which carries out panorama continuous shooting of the same location at intervals of several seconds using two eyes (it is suitable when having ridden on the very late mobile, and carrying out stereo photography of a panorama using migration of the view by this migration)

After carrying out a panoramic exposure using panorama 180:2 eye, an one of the two lens case is rotated, and 180 large panorama scenery photography is performed. You may be the device which lens of one of the two rotates automatically [it is electric and].

[0079] After carrying out a panoramic exposure using panorama 360:2 eye, an one of the two lens case is rotated, and 360 large panorama scenery photography is performed. You may be the device which lens of one of the two rotates automatically [it is electric and].

[0080] And camera section (a graphic display left camera section) of one of the two carries out a horizontal revolution 360 degrees a panorama and for stereo photography (refer to drawing 29).

[0081] Furthermore, the liquid crystal display 83 for a check is formed in the tooth back of a body 81, the image of the right and left corresponding to the mode at the time of photography can be checked, and it is possible to display image data [finishing / photography] on a naked eye stereoscopic vision display etc. Thereby, a mistake, a mode difference, etc. in right and left can be checked, and the error of employment of a user can be lost. Moreover, there is an advantage that the check of the image before photography and the check of a photography result can be immediately performed by making naked eye stereoscopic vision possible.

[0082] Moreover, the interface which connects the liquid crystal shutter glasses which synchronized with the video output interface of a vertical refresh rate 100 Hertz or more and this may be established. Moreover, the level check at the time of photography becomes easy by establishing level detection means, such as an electronic level sensor and cellular level. Moreover, the right-and-left information photoed with the lens on either side is recorded simultaneously, and you may enable it to use later at the time of edit and appreciation.

[0083] Operation gestalt >> drawing 30 of << stereoscopic vision image creation system is the outline block diagram of the stereoscopic vision image creation display system which is the operation gestalt of this invention. This false stereoscopic vision system is a system which captures the stereo image photoed with the camera mentioned above, and indicates by stereoscopic vision. In addition, the image to capture may use the image which it was not limited to what was photoed with the above-mentioned camera, but was read with the scanner, the image received through the network.

[0084] This stereoscopic vision image creation display system has a personal computer 1, a display 2, the input device 3, the image input device 4, and the liquid crystal shutter glasses 5. In addition, there may not be the liquid crystal shutter glasses 5. The input device 3 consists of a keyboard and a mouse, and the digital camera (a digital camcorder is included) which photoed the stereo image using the adapter is used for the image input device 4. Moreover, when the camera which photoed the stereo image using the above-mentioned adapter is a film-based camera, the scanner which scans the film scanner which scans the developed film, or the printed photographic paper is used. A personal computer 1 captures an image from the image input device 4 according to actuation of a user's input device 3. And the group image of stereoscopic vision is created by internal processing. And according to actuation of a user's input device 3, this is displayed on a display 2.

[0085] Hereafter, processing actuation of a stereoscopic vision image creation display system is explained. Drawing 31 , drawing 32 and drawing 43 , and drawing 44 are flow charts which show actuation of this personal computer. In drawing 31 , image data is incorporated from an image input device by s1. The stereo group image with which which image identifies whether it is a left image and is the image of a right viewing angle, and consists of a right-and-left image is extracted from this inside (s2).

[0086] Hereafter, the extract of a stereo group image is explained. Drawing 5 (C) As shown in -(I), when two or more image files copy a certain discernment image and are photoed, a group image is extracted based on this identifier. Here, a group image is a series image which consists of a right image of two or more sheets which changed a left image, the pair image per right image or the left image of one sheet, and spacing, and was photoed. The black image file of the ends of the image file which continues in drawing 5 (C) is an image file photoed by carrying out a mask to intentionally, in order to show initiation and termination of series. Discovery of a black image file judges that to be the break of a series image. Moreover, the black image copied the left end or at the right end of this drawing (D) - (I) is a mark image by the key 14 shown in drawing 2 etc. [of an image file] It is judged that the image file which has a mark image at a left end is a left image, and or the image file which has a mark image at a right end is a right image, in the case of a series image, it is judged to be a right end image.

[0087] Moreover, even if there is [image file / itself] nothing in open based on the data attached to a file name or each image file, when it can judge, the file name and data extract a stereo group image.

[0088] Moreover, as shown in drawing 5 (A) and (B), when there is no mark in an image file and a group image can be judged neither by the file name nor data, a group image is extracted based on the description of the image itself. This takes the histogram of the color of an image and the technique of judging with the similarity is used for it. Since a throughput will become huge if the histogram of the whole image is taken, the predetermined histogram of several lines with an image in every direction is taken, and this is compared.

[0089] Moreover, one sheet as shown in drawing 5 (J) is divided into the image of right and left of (s3) and this when an image file is divided into a right-and-left image (s4). Thus, the new file name which indicates that it is a stereo image on either side is given to the image data of the right and left extracted and created (s5).

[0090] And the stereo image of these right and left is processed so that the stereoscopic vision of magnitude or physical relationship may become possible (s6). (automatic solidification processing) The procedure of this automatic solidification processing is shown in drawing 33 - drawing 35 . Processing of solidification is processing fundamentally piled up like the technique of drawing 33 (B) so that the image of a short distance may be most in agreement by right and left. This is for making it the depth perception when carrying out stereoscopic vision arise from a screen toward the back. When an image on either side is compounded like the technique of this drawing (A) so that a distant view may be in agreement, and stereoscopic vision is carried out, it is visible, and it is hard to appreciate and becomes as depth perception arose before the screen and the image is sticking out of the screen. Thus, when compounding an image, an image on either side needs to be an image of the same scale factor and the same include angle (level). For this reason, as shown in drawing 34 , when the conditions of the right image R differ variously to the left image L used as criteria, this is corrected according to a left image. When the histogram of an image on either side is taken, a difference of brightness on either side, a hue, and contrast is known. When these differs extremely, natural stereoscopic vision is not made. Then, a right image is corrected according to this. That is, an image processing is carried out so that the histogram of brightness, a hue, and contrast may be mostly in agreement. And when distance (scale factor), image size, an inclination, and right-and-left gap differ from every direction, an image file is corrected so that it may become the image of the respectively same scale factor, the same size, the same include angle, and the same direction. In this case, by specifying three common points on an image on either side, respectively, as shown in drawing 42 , a revolution of an image, amplification, and a right-and-left decision are made automatically, and a stereo image can be created.

[0091] Thus, since the synthetic part of an image to this mark image has separated, it cuts off the garbage of the right-and-left image containing this mark image, and you may make it save it from an image file, as you may make it delete this when displaying, and shown in this drawing (B) drawing 35 (A) So that it may be shown when said mark image is copied by the compounded image file.

[0092] In drawing 31 , the stereo group image data processed possible [stereoscopic vision] by the above-mentioned processing is outputted by the method according to a demand of a user (s7-s10). As a method of an output, an output (s9) and the printout (s10) to paper occur as a display (s8) on a display, and an image file.

[0093] Drawing 32 is a flow chart which explains the display action of the above s8 to a detail. A user chooses a display mode first (s13). A display mode is four kinds, naked eye stereoscopic vision mode, 3D scope mode using 3D scope, 2 prejudice mode using 2 prejudice, and the interlace 3D mode using liquid crystal shutter glasses, as shown in drawing 36 . It judges which display mode was chosen by s14. When naked eye stereoscopic vision mode is chosen, it arranges in spacing of 6cm which is spacing of the eye of right and left of an image on either side of human being, a screen is constituted (s15), and this is displayed (s16). A user looks at a right image by the right eye, and does stereoscopic vision of the small image by his capacity while he looks at a left image by the left eye. When 3D scope mode is chosen, an image is arranged according to spacing of the objective of 3D scope (s17), and this is displayed (s18). A user does stereoscopic vision of the big image by seeing this screen using 3D scope which inputs a separate image into an eye on either side using a mirror. When 2 prejudice mode is chosen, a left image is changed into red and a right image is changed blue (s19). And it compounds and it is displayed that these images become the relation of drawing 33 B (s20).

[0094] On the other hand, when interlace 3D mode is chosen, it is displayed by turns that an image on either side becomes the physical relationship of drawing 33 B. That is, while displaying a left image first (s21), a left eye ON signal is outputted from interface 1a (s22). This signal is transmitted to the liquid crystal shutter glasses 5. After standing by for 10ms in this condition (s23), while switching a display to a right image (s24), a right eye ON signal is outputted from interface 1a (s25). And after standing by for 10ms in this condition (s26), it returns to s21 and this actuation is repeated. Thereby, the display switch timing of a screen and the switch timing of a liquid crystal shutter can synchronize, and stereoscopic vision of the automatically big image can be carried out. In addition, when liquid crystal shutter glasses are connected to the personal computer 1, the mode of liquid crystal shutter glasses may be made to be chosen automatically.

[0095] In order to prevent the fatigue of an eye in each appreciation mode, it may be made to warn of generating for example, an alarm sound for every fixed time amount etc. Moreover, you may make it cancel the display mode of stereoscopic vision compulsorily by fixed time amount. Moreover, the appreciation time amount in each mode is recorded and you may enable it to refer to the utilization time.

[0096] In addition, when carrying out stereoscopic vision using liquid crystal shutter glasses or 2 prejudice, the method displayed using the display which was attached to the digital camera as shown in drawing 37 (A) in addition to the method using the display of the personal computer system shown in drawing 30 as it is, and the method which connects a digital camera to a large-sized display or television as shown in this drawing (B), and is displayed on these large-sized displays or television can be adopted. In this case, a digital camera performs extract processing and synthetic processing of the above-mentioned group image.

[0097] Moreover, you may make it connect the various devices which contain a personal computer as removable media, such as a memory card set to a digital camera, a digital camera, etc., a network, MO, a floppy disk, and CD-ROM, an image scanner, etc. can be used as the source of image data as shown in drawing 38 , and shown in drawing 39 through a set top box.

[0098] Moreover, since liquid crystal shutter glasses have the low transmission of light, when the mode of liquid crystal shutter glasses is chosen, automatic processing which makes the brightness of a display high a little may be performed. Moreover, it may be made to carry out an automatic switch at the resolution and display timing which can demonstrate the engine performance which switches a screen above 100Hz.

[0099] Moreover, while displaying the stereo image, you may make it display that the pointer of a mouse can also carry out stereoscopic vision together with this stereo image according to a right-and-left image. That is, the pointer image for left eyes and the pointer image for right eyes are constituted independently.

[0100] Moreover, the depth information on the object currently photoed using the gap of right and left of a stereo image can also be acquired. And the image which could also display the contour-line image using this depth information, or expressed height by the thickness of a color can also be displayed.

[0101] Drawing 43 shows the detail actuation at the time of choosing file output mode as output mode. A user chooses the format (mode) of a file output first (s30). File output mode is four kinds, naked eye stereoscopic vision mode, 3D scope mode, 2 prejudice mode, and interlace 3D mode, like a display. It judges which file output mode was chosen by s31. When naked eye stereoscopic vision mode is chosen, it arranges in spacing of 6cm which is spacing of the eye of right and left of an image on either side of human being, and a screen is constituted (s32), and this is compounded and it outputs by making it one image file (s33). A file output specifically has transmission to other terminal units etc. through the preservation to a hard disk, and a network. When 3D scope mode is chosen, an image is arranged according to spacing of the objective of 3D scope (s34), and it outputs by making this into one image file (s35). When 2 prejudice mode is chosen, a left image is changed into red and a right image is changed blue (s36). And these images are compounded so that it may become the relation of drawing 33 B, and it outputs to a file (s37). On the other hand, when interlace 3D mode is chosen, the file which combined the sequence data and the image data of an image change-over so that actuation of drawing 32 of s21 to s26 might be carried out is created and outputted. If this file is reproduced, an image is reproducible in interlace 3D mode.

[0102] Drawing 44 shows the detail actuation at the time of choosing a print mode as output mode. A user chooses a printing format (mode) first (s40). A print mode is three kinds, naked eye stereoscopic vision mode, 3D scope mode, and 2 prejudice mode. In a print, since interlace 3D display is impossible, the mode does not exist. It judges which print mode was chosen by s41. When naked eye stereoscopic vision mode is chosen, it arranges in spacing of 6cm which is spacing of the eye of right and left of an image on either side of human being, a screen is constituted (s42), this is compounded, and it prints on the form of one sheet (s43). When 3D scope mode is chosen, an image is arranged according to spacing of the objective of 3D scope (s44), and this is printed on the form of one sheet (s45). When 2 prejudice mode is chosen, a left image is changed into red and a right image is changed blue (s46). And these images are compounded so that it may become the relation of drawing 33 B, and it prints on the form of one sheet (s47).

[0103] In addition, although the personal computer is used as an image data processor with this operation gestalt, a game machine and a set top box can also be used.

[0104] Although it is necessary to switch the mode of operation of the liquid crystal shutter glasses 5 according to the mode of the image displayed on the operation gestalt >> display 2 of the modal control of << liquid crystal shutter glasses etc., the operation gestalt which enabled it to perform this from a personal computer 1 side is shown in drawing 45 . The block diagram of drawing 45 is the detail drawing near interface 1a of drawing 30 . It has come to be able to perform control of liquid crystal shutter glasses with the configuration of this drawing from the keyboard or software of the personal computer 1 besides the exclusive control box of liquid crystal shutter glasses.

[0105] In this drawing, the video card (VGA CARD) 110 is connected to the personal computer 1, and the monitor 111 and the LCD controller 113 are connected to this video card 110.

[0106] Between the video card 110 and the monitor 111, the SCL line by which the solvent deasphalting line by which a control signal besides the PGB line by which a video signal is transmitted, and a Sync line is transmitted and received, and the clock signal for a synchronization of a control signal are transmitted is connected. Moreover, Above solvent deasphalting and SCL and a Sync line are connected to the LCD controller 113.

[0107] A video card 110 transmits the signal which checks the class of monitor to a monitor 111 through a solvent deasphalting line. On the other hand, a monitor 111 answers a letter in the data in which the class of monitor is shown. This signal is inputted also into the LCD controller

113 through a buffer 114. A buffer 114 is a circuit for operating the wave of a signal orthopedically.

[0108] While the LCD driver 116 and the infrared signal generator 118 are connected, the remote control box 115 is connected to the LCD controller 113. 1 or two or more liquid crystal shutter glasses 117 are connected to the LCD driver 116. Moreover, the infrared transmitting section (IR Transmitter) 119 is connected to the infrared signal generator (IR Generator) 118. An infrared signal is transmitted to the wireless liquid crystal shutter glasses 120 controlled by infrared radiation. The liquid crystal shutter glasses 120 control closing motion of the shutter of a right eye and a left eye based on the infrared signal sent.

[0109] The button switch for a user to switch a mode of operation etc. manually, as for the remote control box 115 etc. is formed. As a button switch formed, there are power-source ON / off switch, an interlace / non-interlaced mode switch, a right-and-left transfer switch, etc.

[0110] Moreover, the mode is not only switched by switch actuation of a remote controller 115, but the LCD controller 113 switches the mode by the count of the control signal outputted from a video card 110. As a control signal, it is READ. The mode is switched by how many times this signal was transmitted in 2 seconds using the signal of EDID. That is, since this signal is a signal which checks ID of a monitor 111, even if it transmits this how many times, it is uninfluential to the setting out of a monitor 111 itself. Then, it is making to carry out multiple-times continuation of this, and to transmit into the command to a LCD controller.

[0111] READ If EDID is transmitted 3 times in 2 seconds, it will become a turn-off command and the LCD controller 113 will suspend the connected liquid crystal shutter glasses 117 (and 120) shutter switch. Thereby, the activity of prolonged liquid crystal shutter glasses can be restricted now from application. Moreover, READ If EDID is transmitted 4 times in 2 seconds, the closing motion timing of a liquid crystal shutter will be set as the mode in which the interlace image from which it becomes an even interlaces command and even lines has become a right image (odd lines is a left image) is seen. Moreover, if READEDID is transmitted 5 times in 2 seconds, the closing motion timing of a liquid crystal shutter will be set as the mode in which the interlace image from which it becomes an interlace odd frame command, and odd lines has become a right image (even lines is a left image) is seen. It is the synthetic image in which the right image and the left image were inserted here at intervals of [as indicated to be an interlace image to drawing 47] a line. Only a right image and a left image are displayed by turns, and an odd frame opens [when such an image is outputted from a video card 110 / the LCD controller 113 / an analog switch 112 is turned on / turned off for every line and / as even frames displays only even lines / for every frame] for every frame and closes the liquid crystal shutter glasses of odd lines by turns.

[0112] READ If EDID is transmitted 6 times in 2 seconds, the closing motion timing of a liquid crystal shutter will be set as the mode in which the non-interlace image from which it becomes an even non-interlaces command, and even frames has become a right image (an odd frame is a left image) is seen. Moreover, READ If EDID is transmitted 7 times in 2 seconds, the closing motion timing of a liquid crystal shutter will be set as the mode in which the non-interlace image from which it becomes a non-interlace odd frame command, and the odd frame serves as a right image (even frames is a left image) is seen. Here, it is the mode in which one a right (left) image and a left (right) image are displayed at a time as a non-interlace image by turns. When such an image is outputted from a video card 110, the LCD controller 113 always turns ON an analog switch 112, and liquid crystal shutter glasses are opened for every frame and closed by turns.

[0113] In addition, the conventional LCD controller does not have the above functions and was performing the mode switch of liquid crystal shutter glasses only with the button switch of a remote controller 115. For this reason, when can switch by the keyboard of a personal computer, and could not control automatically by software, but the liquid crystal shutter was made to open and close for a long time and stereoscopic vision appreciation was carried out, the eye got tired or there was a case where it became painful, but even case [which was such], it could not but turn off manually by itself, and when CHIRATSUKI occurred to liquid crystal glasses, if a child sees accidentally, there may be a problem and it may have developed into PL problem. However, since remote control can be carried out from the keyboard of a personal computer etc., in addition it can control by command control using the configuration and solvent deasphalting of drawing 45 automatically from an application program even if a user does not place a box at hand, it also becomes possible to prevent the wrong usage. Moreover, the above-mentioned PL problem solving is also possible, if fixed time amount which exists automatically passes, the function of the external hardware of stereoscopic vision will become off, or appreciation extension can be carried out at a user's hope, or control becomes possible freely.

[0114] Mode of processing with which << right-and-left image doubles, and the user enabled it to perform alignment of the right-and-left image of a stereo efficiently below operation gestalt >> of the direction is explained. The following actuation of a user is realized with this operation gestalt. When piling up the image of two sheets on a screen manually, after fixing one image on a screen, shifting some images (partition which carried out range assignment with the mouse etc.) of another side on real time and deciding one image, and superposition and a favorite location, the whole image of another side is moved and piled up. Moreover, even if the image of two sheets laps, the section by which both were transparent, was visible and range assignment was carried out with the mouse etc. is also transparent, and the condition of superposition can be judged visually and intuitively.

[0115] In addition, when piling up the conventional image of two sheets manually, one image was fixed on the screen, superposition of the whole image of another side was shifted and carried out on real time, and the favorite location was decided. For this reason, since processing of a rewriting display of an image became heavy, it became impossible to follow actuation of a user in the case of a large image, and there was a fault that working efficiency, such as a case of fine adjustment of gap of an image, falls extremely and the whole image shifted simultaneously, there was a fault that which [of the image of two sheets] is shifted could not judge immediately.

[0116] Hereafter, with reference to a drawing, the procedure of this operation gestalt (personal computer 1) is explained.

[0117] Drawing 46 is drawing showing the flow of processing of this personal computer 1. First, the window for an image composition display is displayed (s101), and the data of an image file on either side are read into this window (s102). Although an image file on either side is the image data of predetermined vertical size x horizontal size, as shown in drawing 47 , interlace composition processing (it is (sufficient [reverse] as odd-even on either side) even lines about a right image odd lines in a left image) is performed for this (s103). Thereby, both right-and-left images turn into an image of one sheet which is transparent and appears. And one side is used as a fixed image among this right-and-left image, and another side is set up with a movable image (s104). And the compounded image is displayed on a display (s105). This example of a display is shown in drawing 48 . It laps and it is displayed that both of images on either side seem to be shown in this drawing on a display. Since a user drags with pointing devices (henceforth a mouse), such as a mouse, and specifies a small region at the time of this display, the break line of that small region is displayed (s106). A user has this field with a mouse and makes it move to the optimal location of arbitration. This is indicated by the interlace in the location under the migration (s107: drawing 49). Since the moved field is a small region, rewriting of this interlace display is also possible for it on real time. When a mouse is opened (s108: drawing 50), as what was determined as the location, a migration location makes it move to the location, and displays the whole migration image (s109: drawing 51). If preservation actuation is carried out in this condition, this image file will be saved and actuation (s110) will be ended. When a migration location is not the optimal, a user redoes actuation not more than s106.

[0118] As mentioned above, the optimal location can be efficiently looked for by piling up dragging with a mouse, and understanding a small region intuitively which image only a few dragged among ZURA **** and the image which has lapped immediately, and choosing an image part characteristic as a small region, and moving this small region to the optimal location. And since the whole image will move to the location if a mouse drag is opened when the optimal location is found, interlace composition processing can be paid for the migration composition processing to the optimal location few.

[0119] operation gestalt [of automatic composition processing of << stereo image] >> -- with this operation gestalt, the processing which compounds automatically the image of two sheets by which stereo photography was carried out in the optimal location is proposed. A personal computer 1 compounds a right-and-left image automatically based on this cylindrical body or a vertical line by specifying this in search of the vertical line of the up and down long cylindrical body or the up and down long body with which this processing occupies at least the one half of a screen out of the body in the image with which the user was photoed. As for the cylindrical body to specify, it is desirable for the ends (whole) to be the things of the almost same distance from a photography person. A user is good only by performing assignment of the top-most vertices of the upper and lower sides of the cylindrical body (vertical line) currently photoed by the image of two right and left, i.e., four points. A personal computer 1 calculates the distance of two points of the ends of the cylindrical body (vertical line) currently photoed by the right-and-left image, an include angle, an inclination, and a location, and automatic superposition of the stereo image of two sheets is performed by making this in agreement.

[0120] Moreover, which is possible also for making an automatic decision of which is a right image by the left image at the physical relationship of two images after performing this automatic superposition. That is, it can be determined that the image protruded into left-hand side from the range where both images overlap is a left image, and the image protruded into reverse on right-hand side is a right image.

[0121] In addition, conventionally, having compared the amount image and looking at it simply manually, the superposition of the two-sheet image of the resemblance by which stereo photography was carried out was doing each one activity of every of an image revolution, scaling, four-directions migration, and right-and-left assignment, and its effectiveness was dramatically bad.

[0122] Hereafter, with reference to the flow chart of drawing 52 , automatic composition processing of this stereo image is explained to a detail. First, the window divided into two is displayed on right and left using the whole display (s111). Each image on either side which read the right-and-left image by which stereo photography was carried out (s112), and was read in the above-mentioned right-and-left window is displayed (s113). At this time, the upper left edge of an image is displayed according to the upper left edge of a window. When image size is larger than a window size, the scroll bar of the upper and lower sides and right and left is displayed. Even when an image is large and overflows a screen at this time, it does not process reducing an image so that it may become legible etc. The way of this is because location count can be performed to accuracy. With this display, the straight line (bar pointer) of the about 2/3 die length of the vertical size of a window is displayed on the core of a window on either side (s114: drawing 53). The bar pointer has the handle (small square) in the upper bed and the soffit, as shown in drawing 53 .

[0123] when an image can be scrolled vertically and horizontally in a window and one image is scrolled by operating a scroll bar in this condition, the image of another side also synchronizes and it is the same as the same direction -- although ** scrolling is carried out (s115), a bar pointer is the location same in a window irrespective of scrolling of an image (s116: refer to drawing 54).

[0124] If an image is scrolled by the suitable location, a user will move the handle of the upper bed of a bar pointer by the drag of a mouse on one window (s117). To compensate for this migration, the bar pointer is indicated by flexible (s118). In addition, the successive range of the upper bed handle of a bar pointer is restricted to the upper half of a window. This is for preventing that a bar pointer becomes short too much and automatic composition processing becomes incorrectness. And if the drag of a mouse is canceled, the location of an upper bed handle will be determined as the mouse location at that time, and the color or configuration of this upper bed handle is changed and displayed (s119). The above s117, s118, and s119 is similarly processed on the window of another side (s120: drawing 55). It is specified that the location of the upper bed handle on a right-and-left image turns into the same location of the same body currently photoed.

[0125] Since two points of the vertical top-most vertices of a bar code pointer turn into two points to specify, it is made for after fixing to change the color or configuration in a round small ring as a configuration which uses as a round small ring and is easy to drag with a mouse.

[0126] Next, in order to specify the soffit handle of a bar pointer, even when an image is scrolled downward, since the location of (s121) and a soffit handle is not determined yet, it is being fixed on the window irrespective of scrolling of an image (refer to drawing 56). In addition, since the location on the image of an upper bed handle is already determined, it is scrolling with the image.

[0127] If an image is scrolled by the suitable location, a user will move the handle of the soffit of a bar pointer by the drag of a mouse on one window (s122). To compensate for this migration, the bar pointer is indicated by flexible (s123). In addition, the successive range of the soffit handle of a bar pointer is restricted to the lower half of a window. This is for preventing that a bar pointer becomes short too much and automatic composition processing becomes incorrectness. And if the drag of a mouse is canceled, the location of a soffit handle will be determined as the mouse location at that time, and the color or configuration of this soffit handle is changed and displayed (s124). The above s122, s123, and s124 is similarly processed on the window of another side (s125: drawing 57). It is specified that the location of the soffit handle on a right-and-left image turns into the same location of the same body currently photoed.

[0128] In addition, it is also possible to redo this when fixing of an upper bed handle and a soffit handle does not work.

[0129] Decision of the location of the upper bed handle of a right-and-left image and a soffit handle moves telescopic motion, a revolution, and four directions of both the whole image so that the bar pointer of an image on either side may lap (s126). At this time, one image is fixed, it may be made to move telescopic motion, a revolution, and four directions so that another side may be aligned with the image of one of these, and it may be made to move telescopic motion, a revolution, and four directions so that the mean value of both images may be taken.

[0130] Interlace composition is carried out, the right-and-left image piled up by the above-mentioned processing is displayed, and a user enables it to check the lap condition (s127). If it laps in the state of this display and a problem is in condition, it will return to s115 and processing will be redone. If lap condition is satisfactory, a file name will be attached by using as a right image the image with which the left image and the right end have not lapped the image with which the left end has not lapped, a right-and-left image will be saved (s128), and processing will be finished.

[0131] When the image of the right and left by which stereo photography was carried out is displayed on a respectively separate window below operation gestalt >> that synchronizes control of the viewing window of << right-and-left image, the operation gestalt which synchronizes only with 1 set of scroll bars, and was changed in the window size and scrolling location is explained.

[0132] A powerful image can be enjoyed when the display on which size differs from resolution, or the stereoscopic vision image of two sheets was displayed to the limit of a screen, carrying out solid appreciation with a threo scope, an image is large and reads from a viewing window by this, and making it the always same part make it display.

[0133] Moreover, as for a longitudinal direction, the appreciation range is restricted by personal capability, although the limit by stereo appreciation does not have a lengthwise direction in case a stereo image is appreciated without a stereoscope only by the naked eye. For this reason, it can be necessary to be made to carry out in the optimal distance display adjustment of the window of right and left of only a longitudinal direction. It enabled it to set up easily the display rectangle according to an appreciation person's capacity with this operation gestalt by taking a synchronization, making it shrunken by the longitudinal direction, or enabling it to lengthen a viewing window on either side from the vertical core of a display.

[0134] In addition, although it was possible to have displayed two windows on right and left side by side conventionally When an image is large and overflows a window, it is necessary to scroll independently and to carry out alignment of the image currently displayed on the window on either side. Actuation was very troublesome, and since it was difficult to make it the same even if it scrolled the physical relationship of a right-and-left image, it was difficult for cubic effect to differ, whenever a location moves, and to appreciate the whole by the same sensibility. Moreover,

even when the magnitude of a window was changed, each window needed to be contracted separately or needed to be lengthened, scrolling of an image also needed to be performed according to the individual at this time, and time and effort and perseverance were required.
[0135] With reference to a drawing, window control processing of this operation gestalt is explained below. Drawing 58 and drawing 59 are drawings explaining the window control processing for stereoscopic vision scopes (3D scope). In the flow chart of drawing 58 , the right-and-left image of a stereo is read first (s131). Next, the maximum display area (the number of in-every-direction pixels) of a display is computed (s132), this is divided into two at right and left, two windows are displayed (s133), and it is displayed on each window that a right-and-left image can carry out stereoscopic vision appreciation by computed physical relationship (s134: drawing 59). Although the right-and-left scroll bar and the vertical scroll bar are displayed on the window on either side, respectively, if the scroll bar of one window (for example, left window) is moved, synchronizing with this, the scroll bar of the window (for example, right window) of another side can also be moved, and a user can determine a favorite location (s135). The user determined the favorite location and does after stereoscopic vision scope appreciation (s136).
[0136] Drawing 60 and drawing 61 are drawings explaining the window control processing for stereoscopic vision by the naked eye. In the flow chart of drawing 60 , the right-and-left image of a stereo is read first (s141). Next, the maximum display area (the number of in-every-direction pixels) of a display is computed (s142), a display is divided into two from a core at right and left, two windows are displayed, and only a longitudinal direction makes a window size adjustable (s143). In addition, a lengthwise direction is fixed with the maximum size of a display which can be displayed. It is displayed on each window that a right-and-left image can carry out stereoscopic vision appreciation by computed physical relationship (s144: drawing 61). When it can expand and contract in a longitudinal direction and a window on either side makes one window expand and contract, the window of another side also synchronizes, and it is expanded and contracted by the same size. In addition, a right-hand side window is expanded and contracted when the right-hand side moves to right and left, and a left-hand side window is expanded and contracted when left part moves to right and left. Moreover, although the right-and-left scroll bar and the vertical scroll bar are displayed on the window on either side, respectively, if the scroll bar of one window (for example, left window) is moved, synchronizing with this, the scroll bar of the window (for example, right window) of another side can also be moved, and a user can determine a favorite location (s145). A user does stereoscopic vision appreciation by the naked eye, after determining a favorite window size and a favorite location (s146).
[0137] So that stereoscopic vision appreciation can be carried out using the right-and-left parallax of the eye of operation gestalt >> human being who displays the depth information on << stereo image In case the image of the image (a right image or left image) of another side to one image (a left image or right image) is created The depth condition of the image cross section is made shown in real time a graph table within a left end belt frame in the belt frame of the upper bed of the viewing window of an image according to the location of the cursor of a screen in every direction, and the die length of cursor.
[0138] Depth information-display actuation is explained with reference to the flow chart of drawing 62 , and the example of a display of the display of drawing 63 . In the flow chart of drawing 62 , the main window, a depth viewing window, and a depth point viewing window are first displayed on a display (s151). The main window is a window which displays the compounded stereo image. A depth viewing window is a window displayed two along with the left part of the main window, and a top chord, and is a window for displaying the depth of the image on the crosshair cursor (a vertical line cursor, horizontal line cursor) displayed on the main window. Moreover, a depth point viewing window is a window for displaying the depth of the intersection of the above-mentioned crosshair cursor for a depth bar and a numeric value.
[0139] If a window is displayed, a false stereoscopic vision image will be read into the main window (s152), and the crossline cursor which consists of a vertical line cursor and a horizontal line cursor on the main window will be displayed (s153). The depth value of the intersection of crossline cursor is calculated and this is displayed for the depth bar and numeric value of a

depth viewing window (s154). Moreover, the depth value of the assignment point (intersection of crossline cursor) can be specified as reverse for a depth bar or a numeric value, and an image can also be corrected so that the depth value of the assignment point may become so.
[0140] the next -- a vertical line cursor -- meeting -- a series of depth information -- the depth viewing window of a vertical line -- graphical representation -- carrying out (s155) -- along with a horizontal line cursor, graphical representation of a series of depth information is carried out to the depth viewing window of a horizontal line (s156). Crossline cursor can be moved to the location of arbitration by mouse actuation (s157). A file is saved in the place which became desired depth (s158). Thereby, the feeling of depth of false stereoscopic vision can be set up the the best for arbitration.
[0141]
[Effect of the Invention] As mentioned above, according to this invention, the stereo image which is a group image on either side can be certainly photoed by easy actuation, and there is an advantage that discernment processing of right and left after photography also becomes easy.
[0142] Moreover, although there are various methods in carrying out stereoscopic vision using a stereo image, according to this invention, a stereo image can be displayed according to the selected method, and the stereoscopic vision doubled with the class and capacity of the instrument which a user has becomes possible.

[Translation done.]

* NOTICES *

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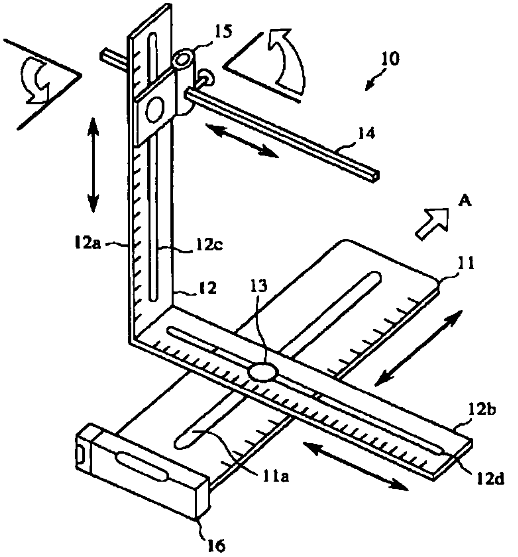
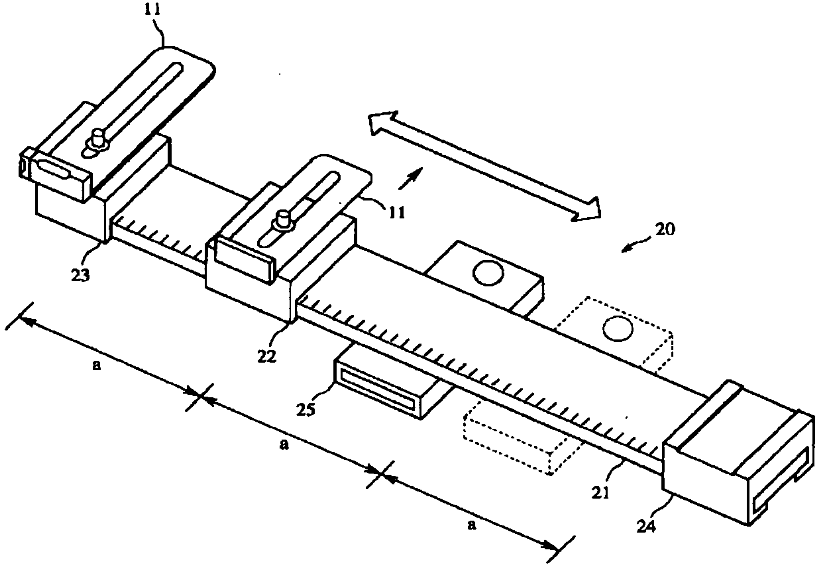
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

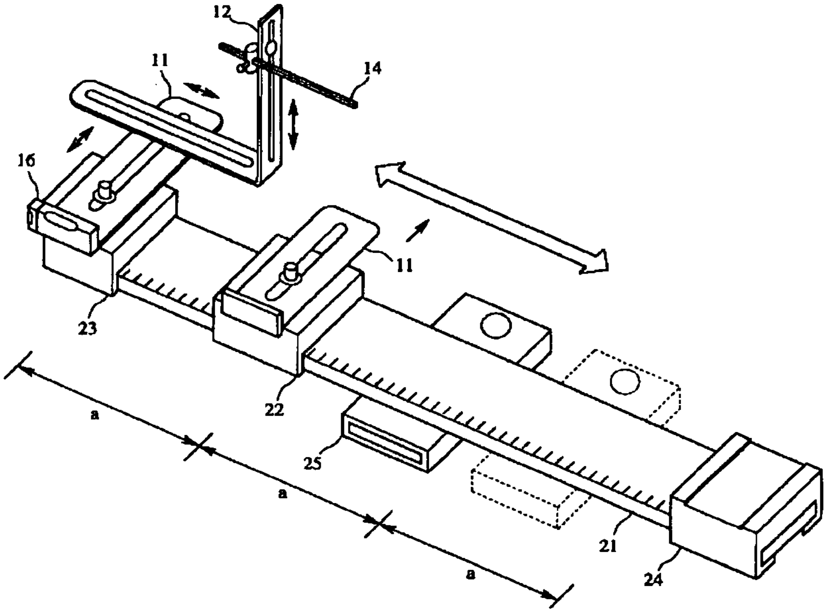
[Drawing 1]


15
10
14
A
12a
12c
12
13
11
12b
11a
12d
16

[Drawing 2]

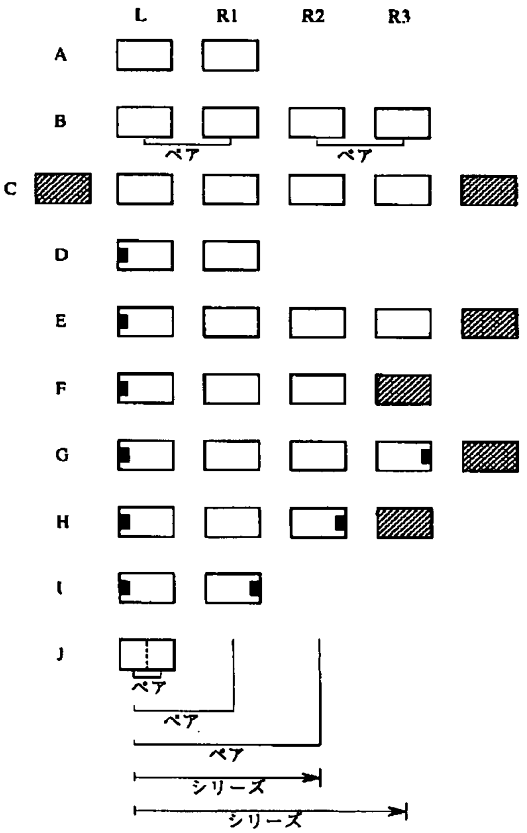

11
11
20
23
22
25
a
a
a
21
24

[Drawing 3]

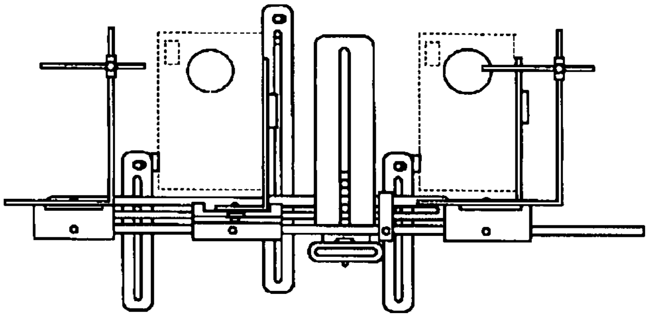

12
11
14
16
11
23
22
25
21
24
a
a
a

[Drawing 5]

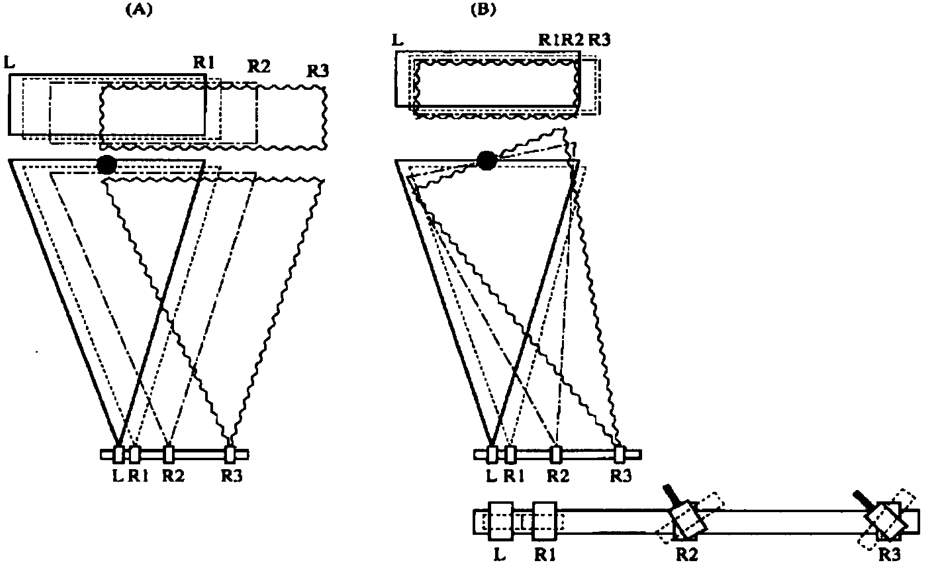
左右ペアとシリーズ判断


L
R1
R2
R3
A
B
ペア
ペア
C
D
E
F
G
H
I
J
ペア
ペア
ペア
シリーズ
シリーズ

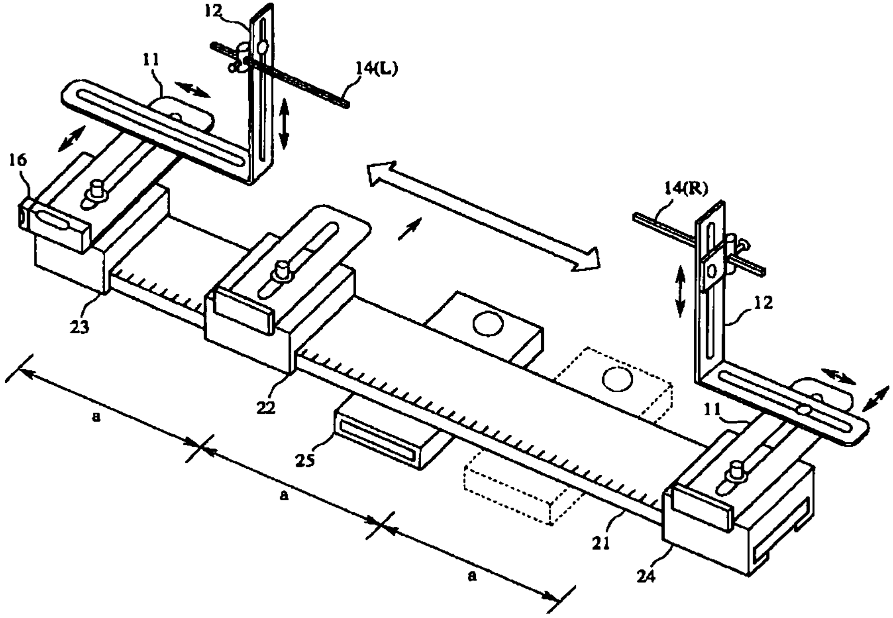
[Drawing 20]



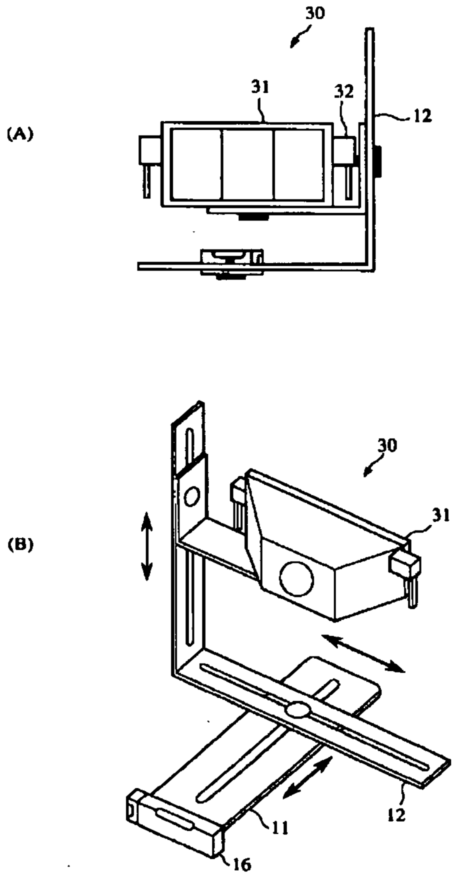
[Drawing 4]


(A)
(B)
L
R1
R2
R3
L
R1R2 R3
L R1 R2 R3
L R1 R2 R3
L
R1
R2
R3

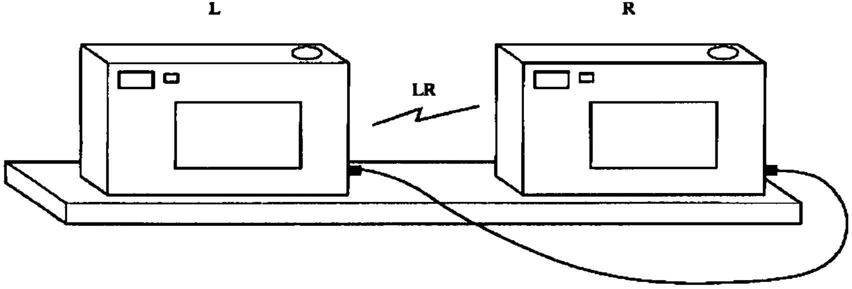
[Drawing 6]


12
11
14(L)
16
14(R)
12
23
22
11
25
a
a
a
21
24

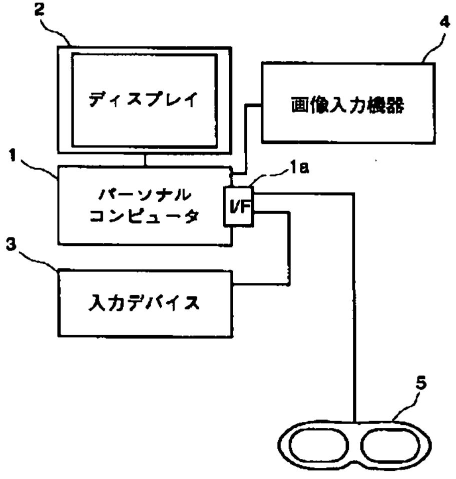
[Drawing 7]


(A)
30
31
32
12
(B)
30
31
11
12
16

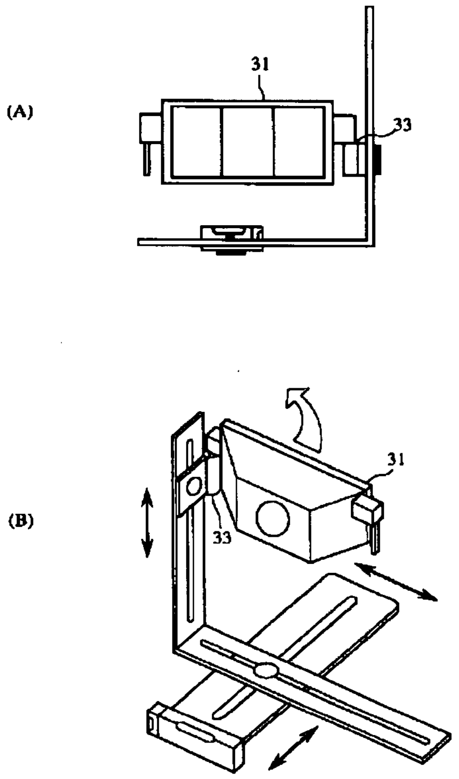
[Drawing 22]



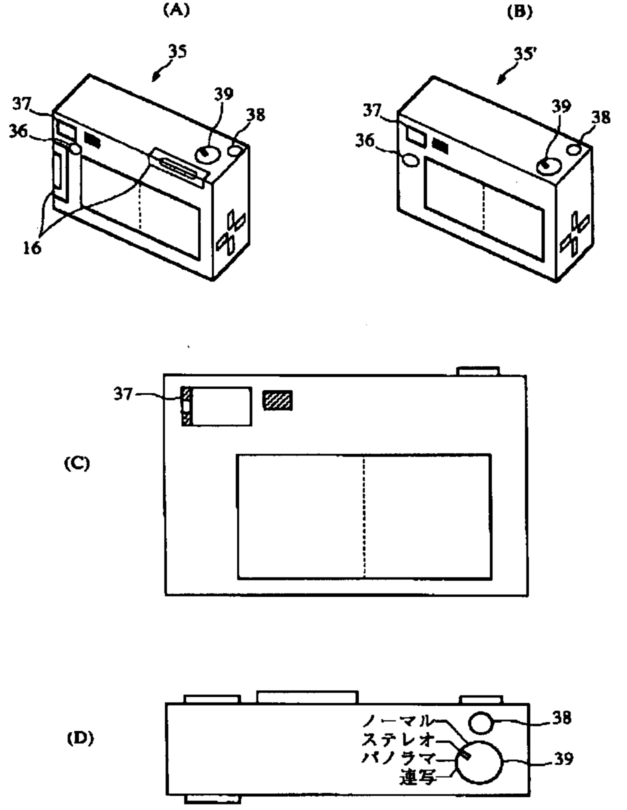
[Drawing 30]


2
ディスプレイ
4
画像入力機器
1
パーソナル
コンピュータ
1a
I/F
3
入力デバイス
5

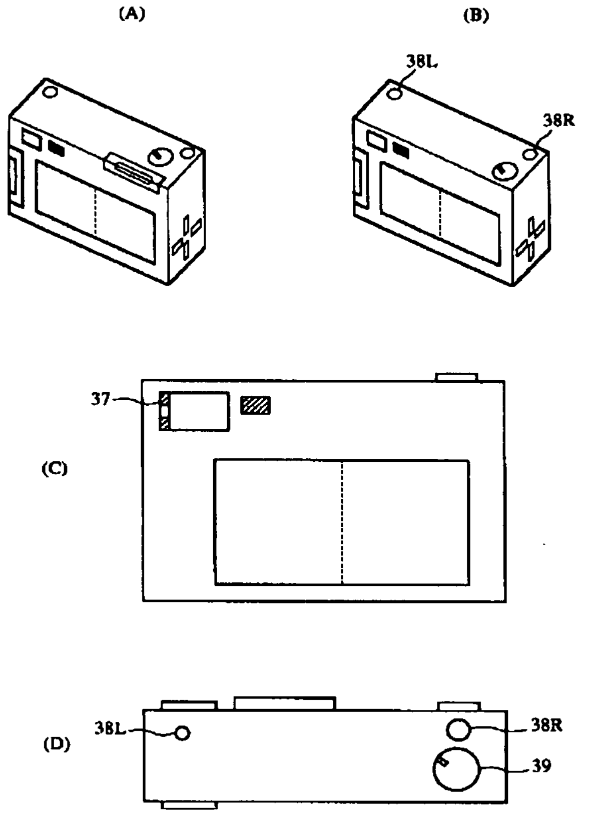
[Drawing 8]


(A)
31
33
(B)
31
33

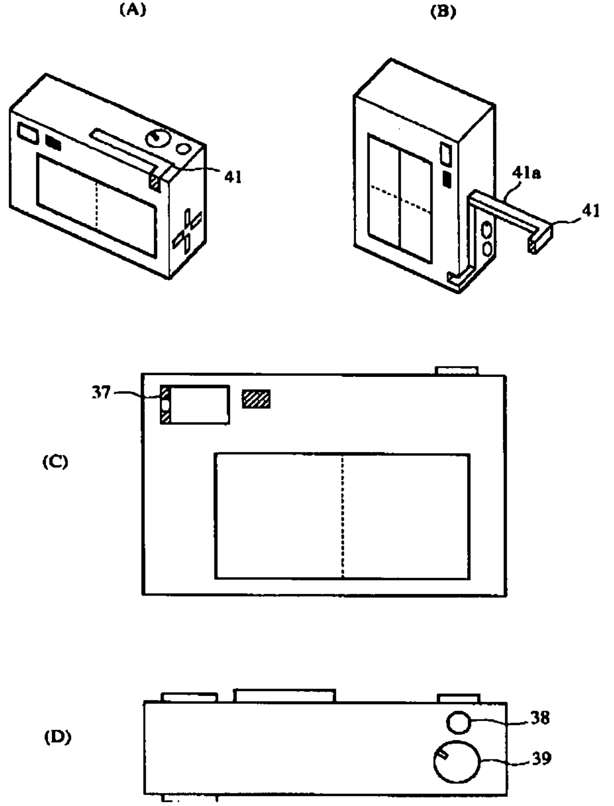
[Drawing 9]


(A)
35
37
36
39
38
16
(B)
35'
37
36
39
38
37
(C)
(D)
ノーマル
ステレオ
パノラマ
連写
38
39

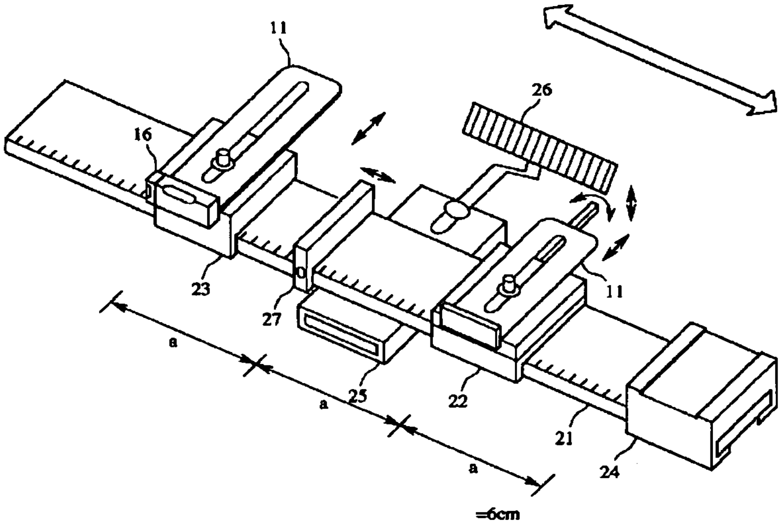
[Drawing 10]


(A)
(B)
38L
38R
37
(C)
(D)
38L
38R
39

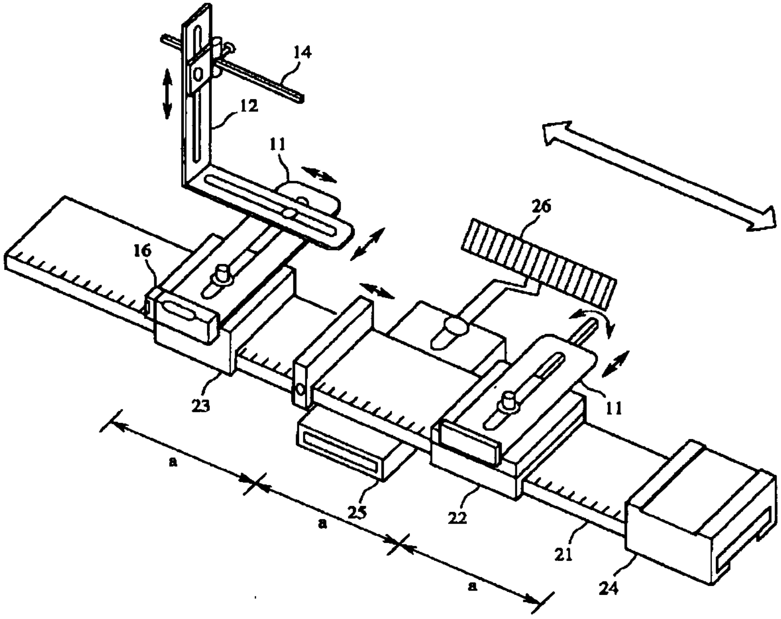
[Drawing 11]


(A)
(B)
41
41a
41
37
(C)
(D)
38
39

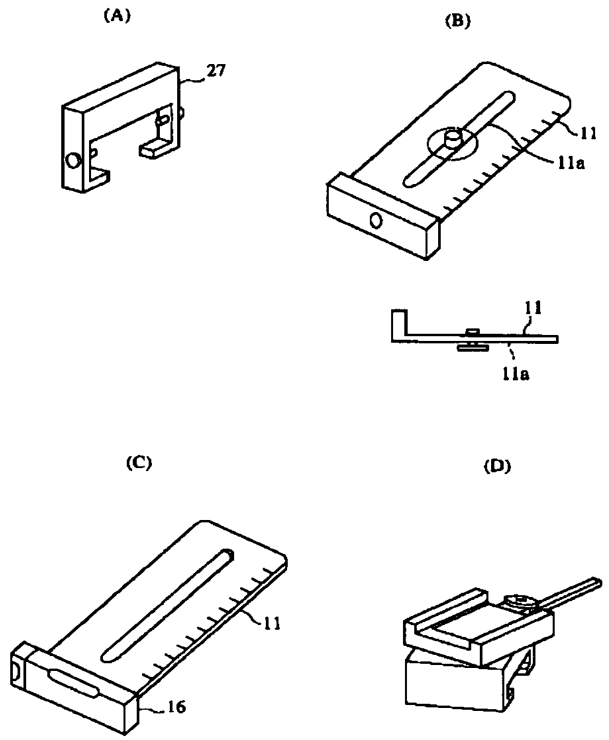
[Drawing 12]


11
26
16
11
23
27
a
25
22
a
21
24
a
=6cm

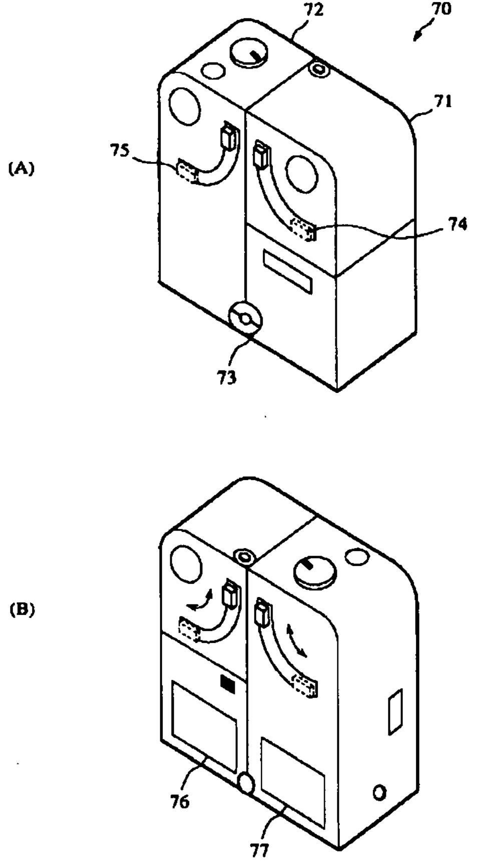
[Drawing 13]


14
12
11
26
16
11
23
a
25
22
a
21
24
a

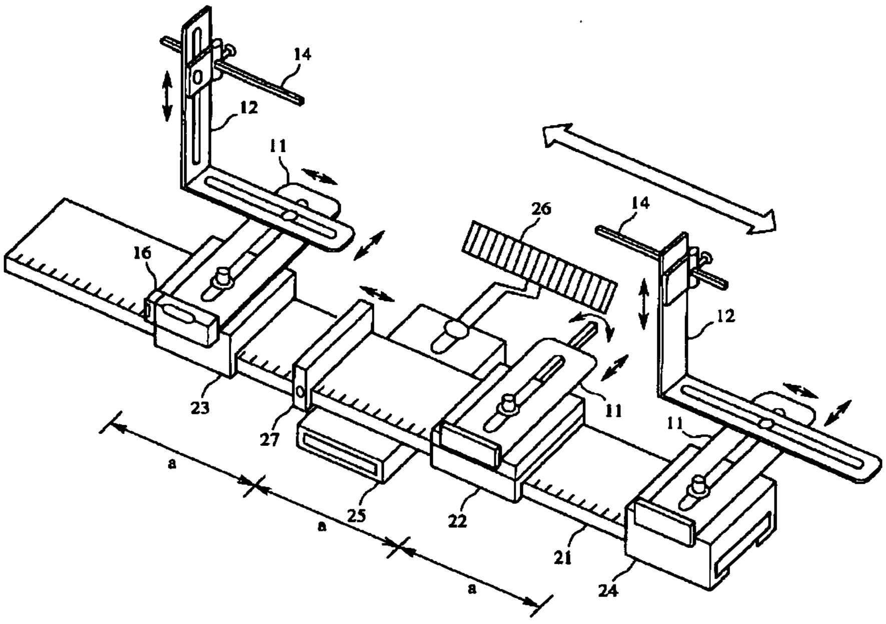
[Drawing 21]


(A)
27
(B)
11
11a
11
11a
(C)
11
16
(D)

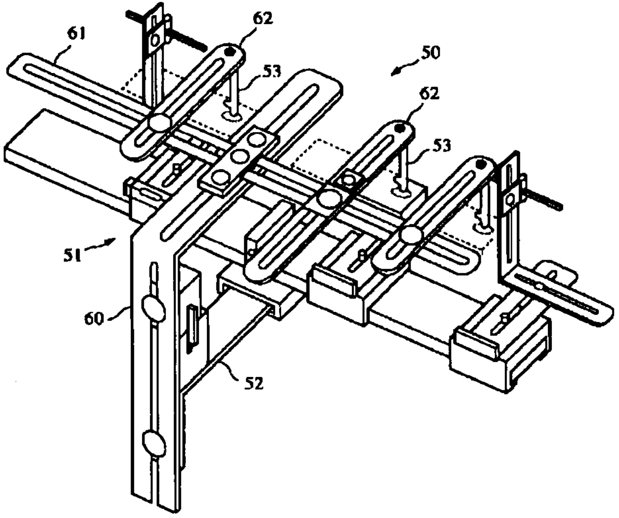
[Drawing 23]


72
70
71
(A)
75
74
73
(B)
76
77

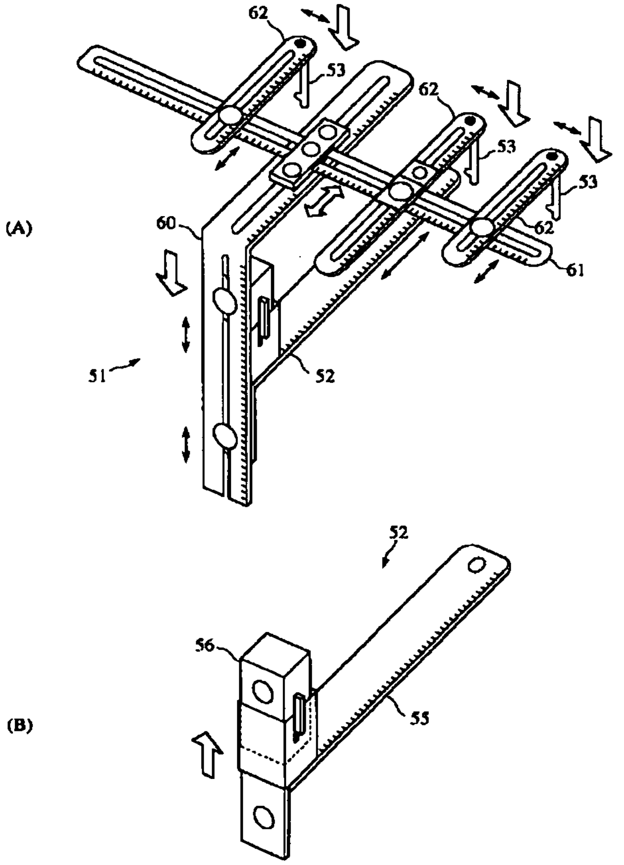
[Drawing 14]


14
12
11
26
14
16
12
23
27
11
11
25
22
21
24
a
a
a

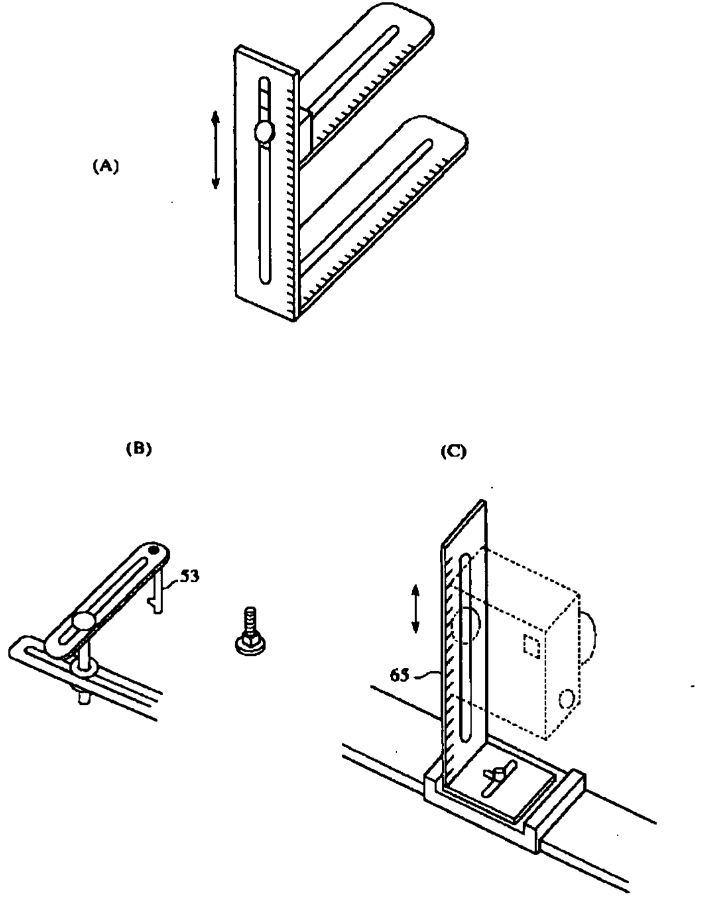
[Drawing 15]


61
62
53
50
62
53
51
60
52

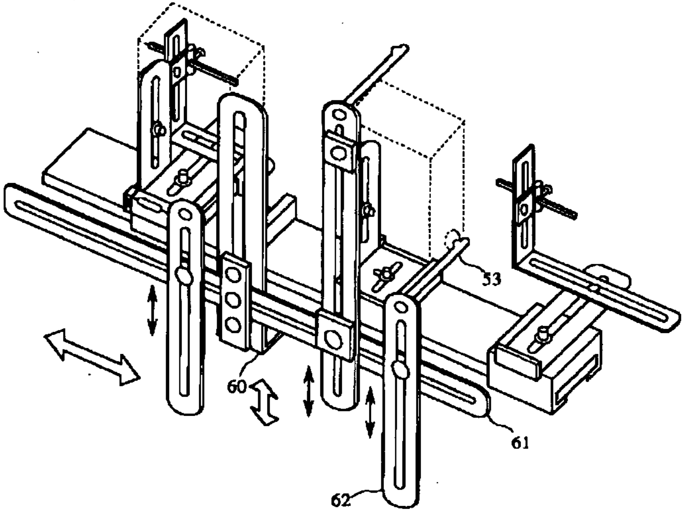
[Drawing 16]


(A)
62
53
62
53
53
60
62
61
51
52
(B)
52
56
55

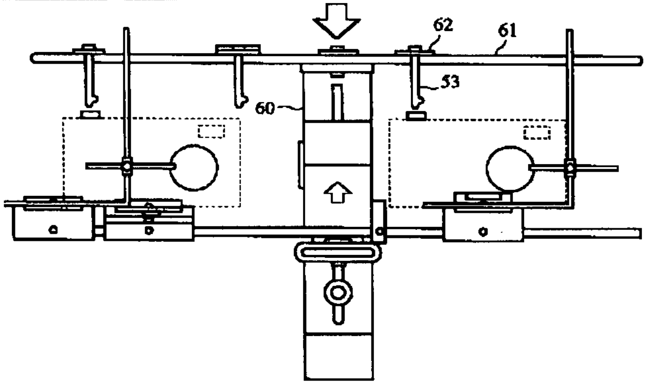
[Drawing 17]



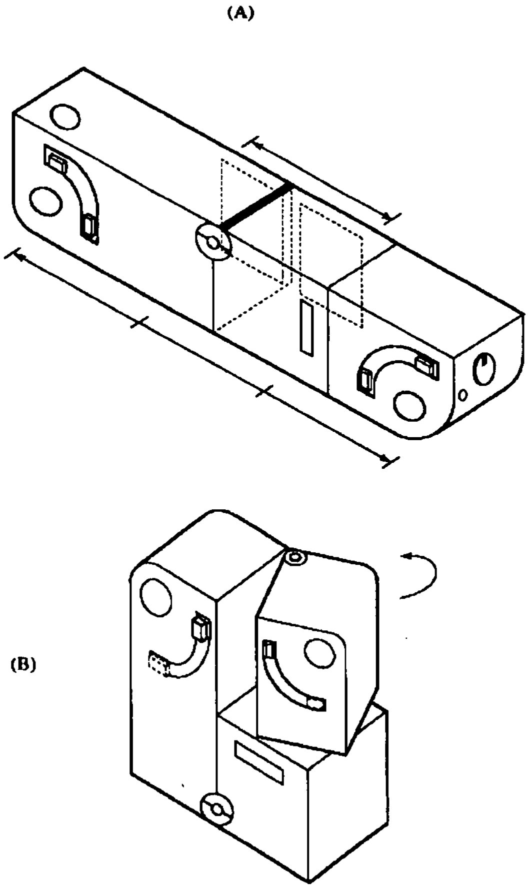
[Drawing 18]



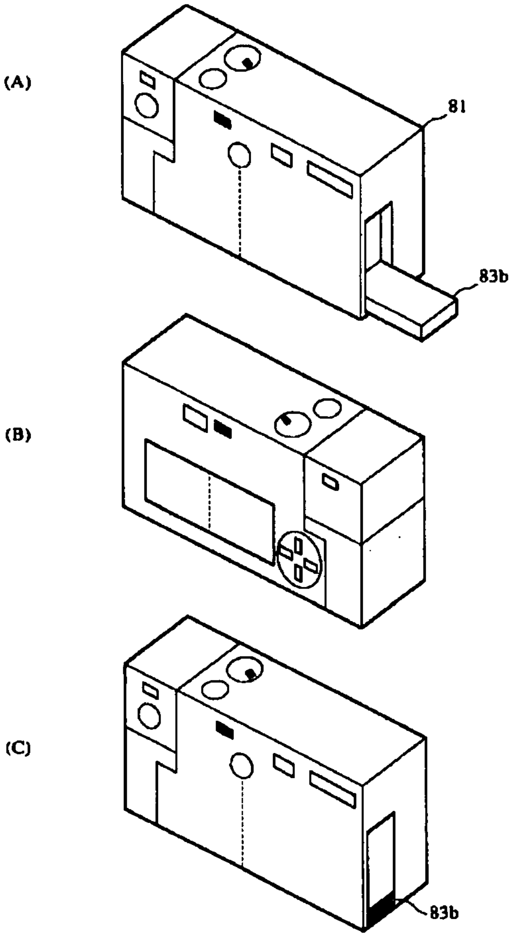
[Drawing 19]



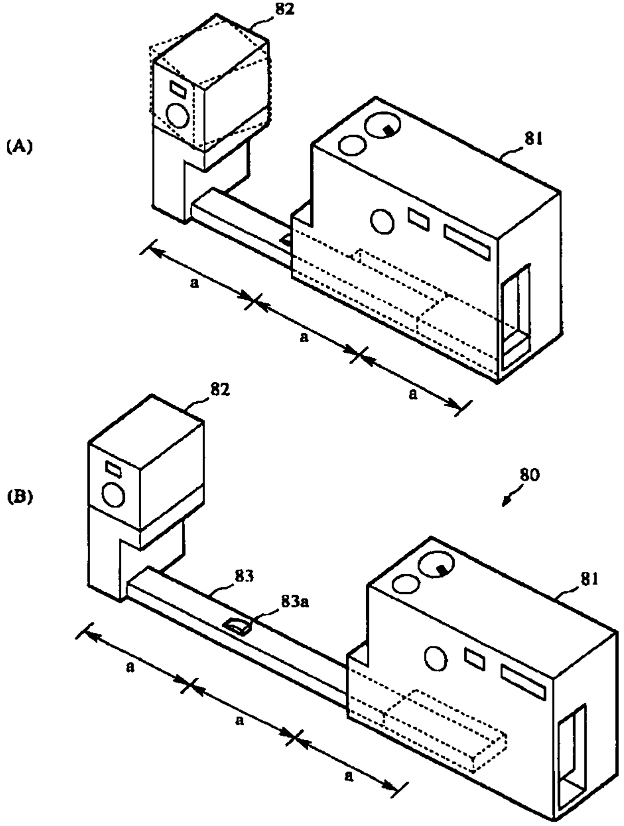
[Drawing 24]



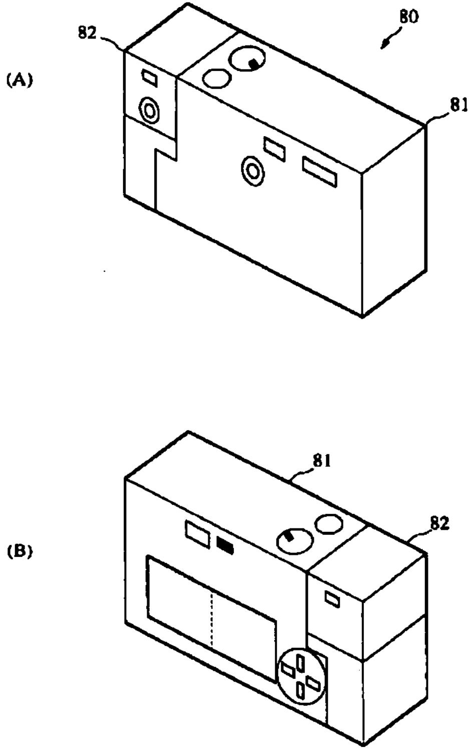
[Drawing 25]


(A)
81
83b
(B)
(C)
83b

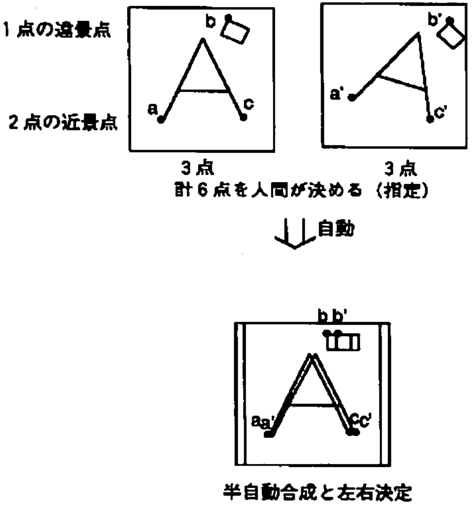
[Drawing 26]


(A)
82
81
a
a
a
(B)
82
80
83
83a
81
a
a
a

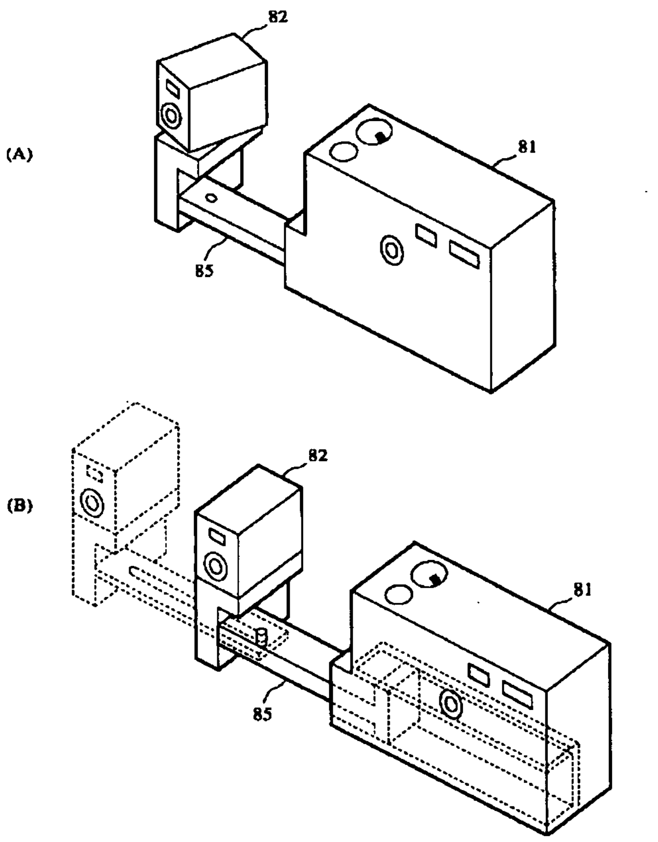
[Drawing 27]


(A)
82
80
81
(B)
81
82

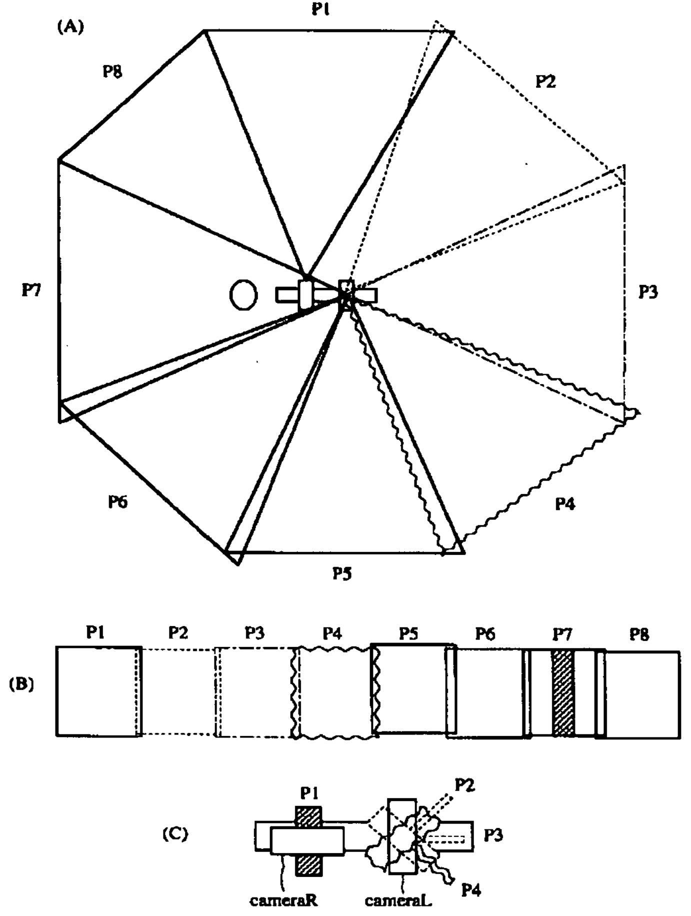
[Drawing 42]


1点の遠景点
2点の近景点
b
a
c
b'
a'
c'
3点
3点
計6点を人間が決める（指定）
自動
b b'
aa'
cc'
半自動合成と左右決定

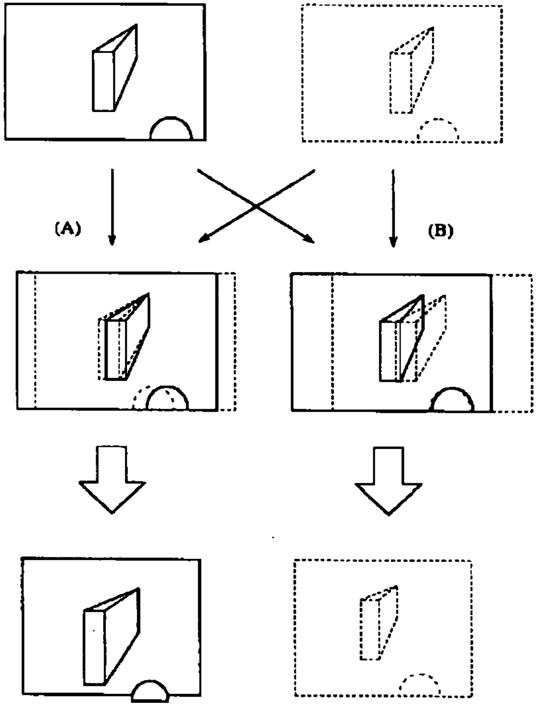
[Drawing 28]


(A)
(B)

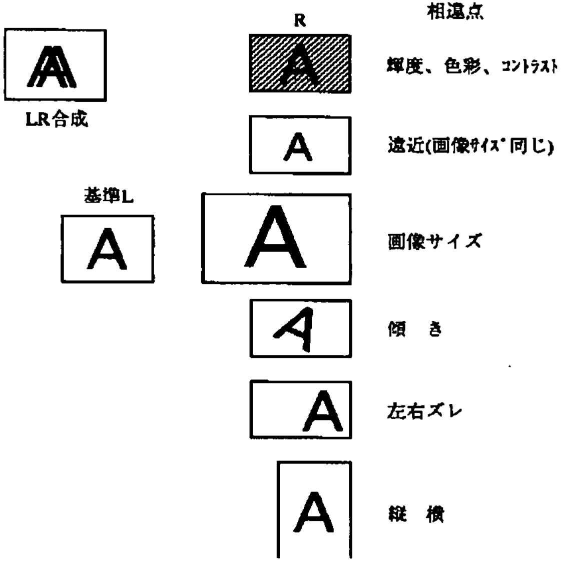
[Drawing 29]


(A)
P1
P8
P2
P7
P3
P6
P4
P5
(B)
P1
P2
P3
P4
P5
P6
P7
P8
(C)
P1
P2
P3
P4
cameraR
cameraL

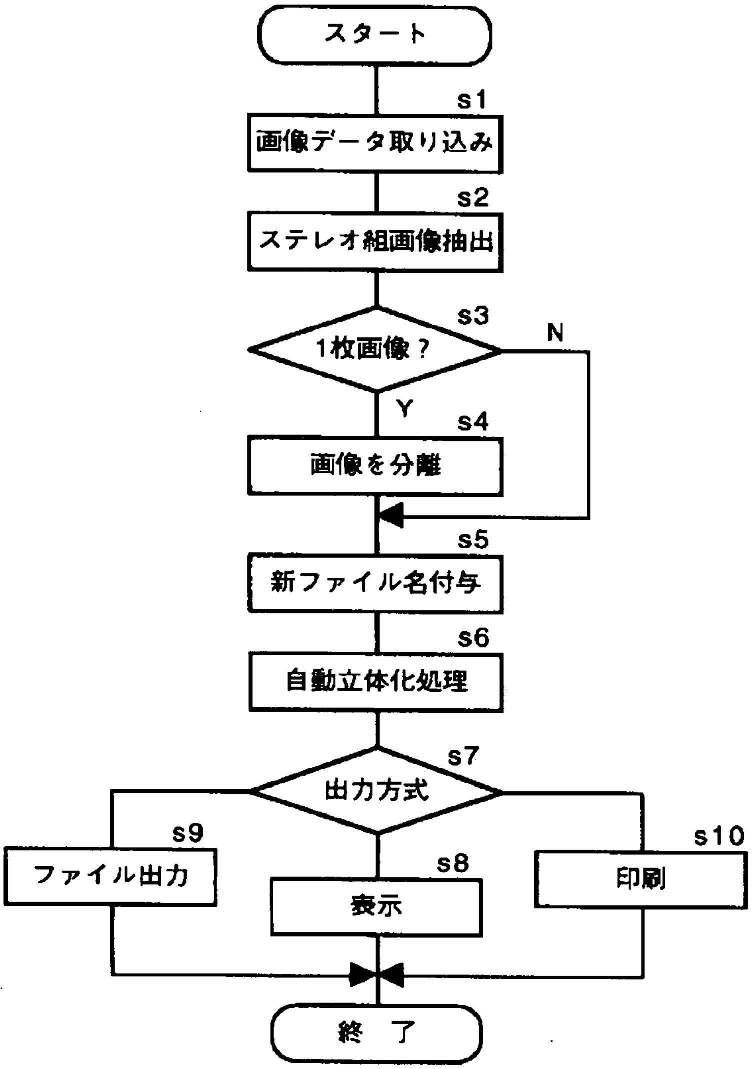
[Drawing 33]



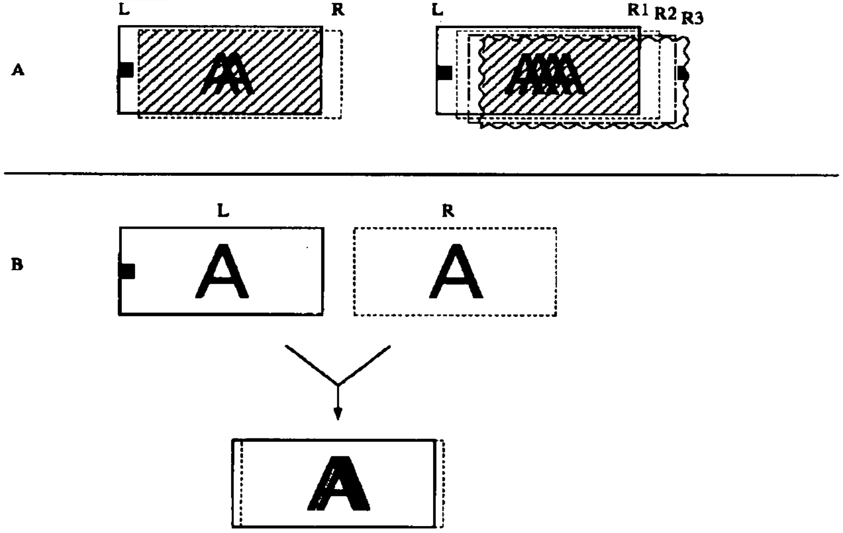
[Drawing 34]


相違点
R
輝度、色彩、ｺﾝﾄﾗｽﾄ
LR合成
遠近(画像ｻｲｽﾞ同じ)
基準L
画像サイズ
傾き
左右ズレ
縦横

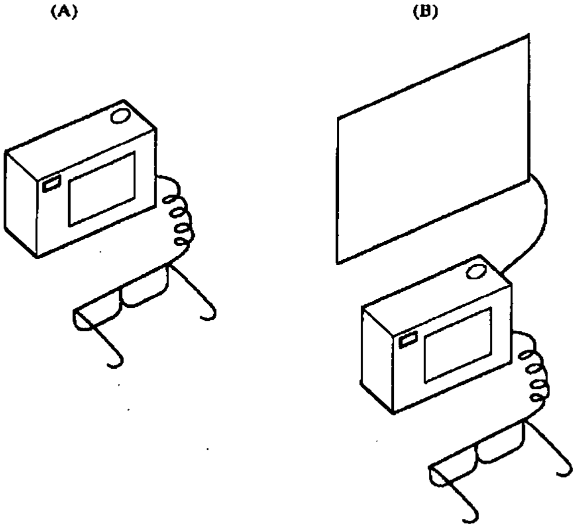
[Drawing 31]


スタート
s1
画像データ取り込み
s2
ステレオ組画像抽出
s3
1枚画像？
N
Y
s4
画像を分離
s5
新ファイル名付与
s6
自動立体化処理
s7
出力方式
s9
ファイル出力
s8
表示
s10
印刷
終　了

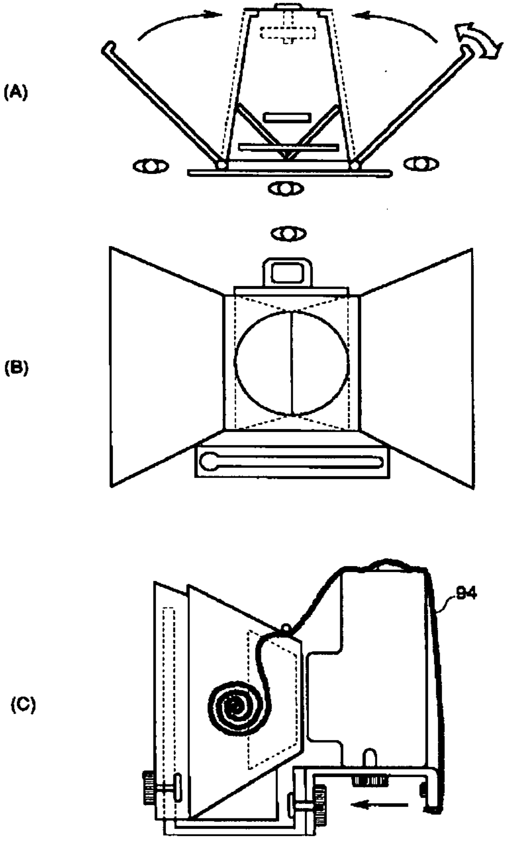
[Drawing 35]


A
L
R
L
R1
R2
R3
B
L
R
A
A
A

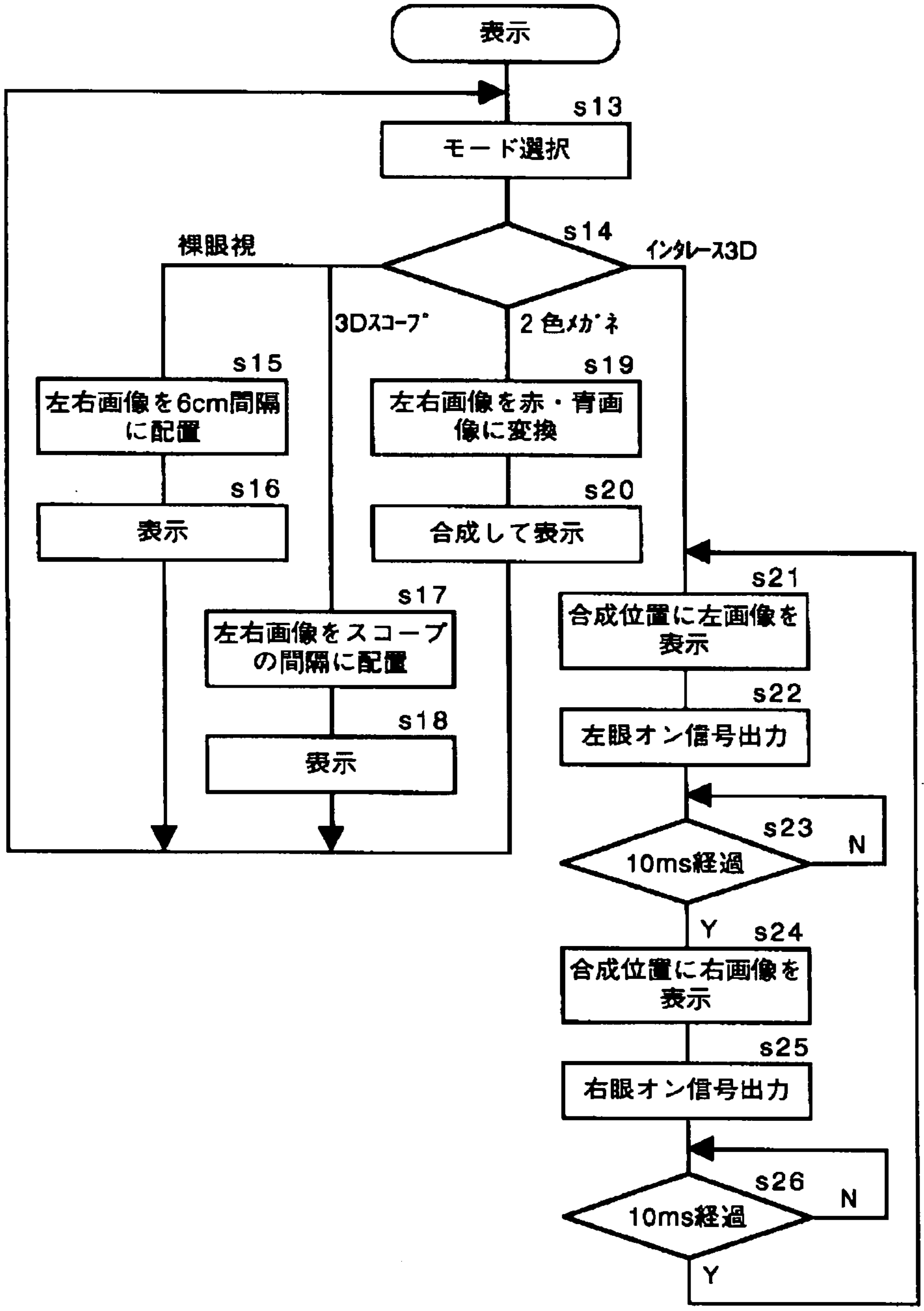
[Drawing 37]



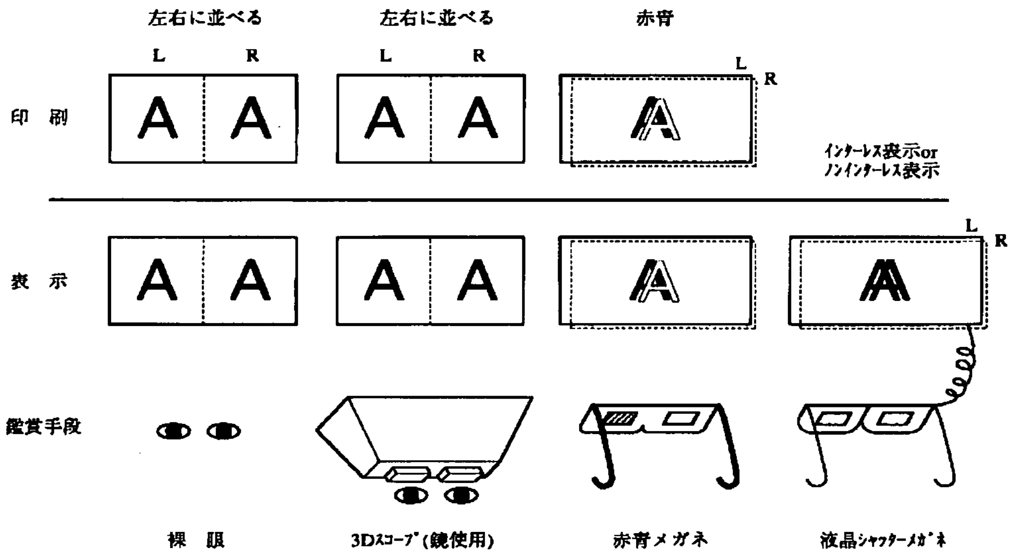
[Drawing 41]



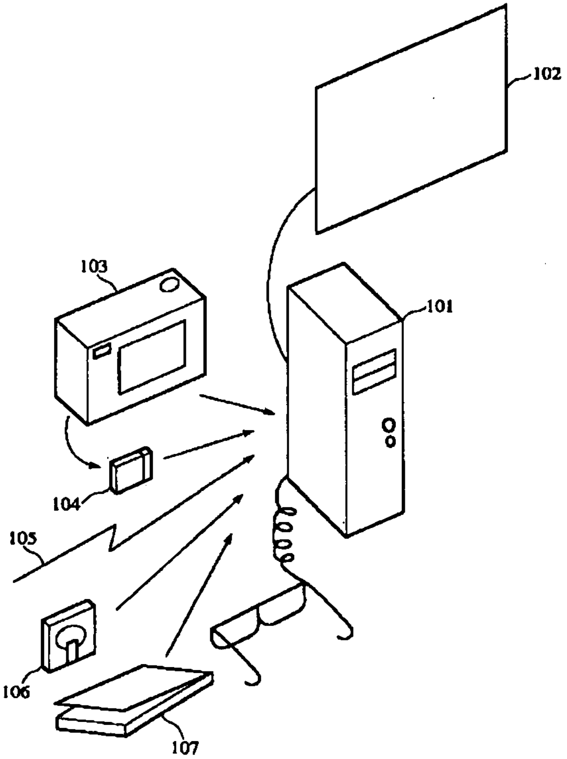
[Drawing 32]


表示
s13
モード選択
s14
裸眼視
3Dｽｺｰﾌﾟ
2色ﾒｶﾞﾈ
ｲﾝﾀﾚｰｽ3D
s15
左右画像を6cm間隔に配置
s16
表示
s17
左右画像をスコープの間隔に配置
s18
表示
s19
左右画像を赤・青画像に変換
s20
合成して表示
s21
合成位置に左画像を表示
s22
左眼オン信号出力
s23
10ms経過
N
Y
s24
合成位置に右画像を表示
s25
右眼オン信号出力
s26
10ms経過
N
Y

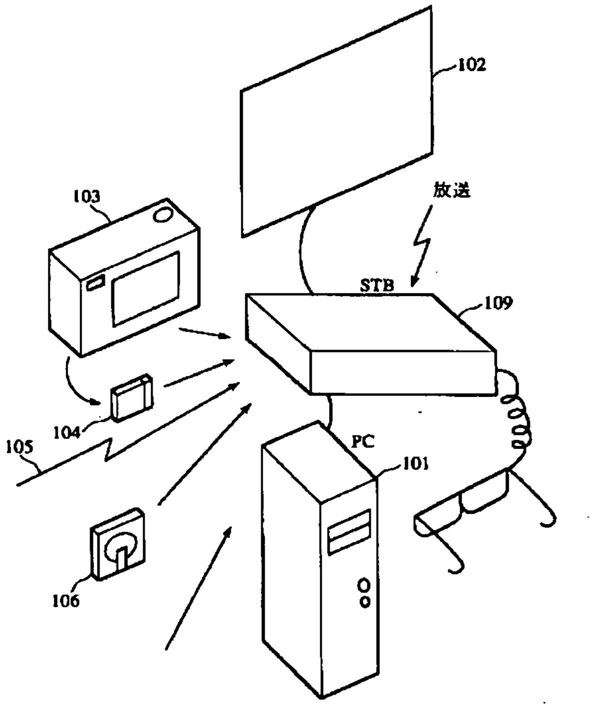
[Drawing 36]


左右に並べる
左右に並べる
赤青
L
R
L
R
L
R
印刷
ｲﾝﾀｰﾚｽ表示or
ﾉﾝｲﾝﾀｰﾚｽ表示
表示
L
R
鑑賞手段
裸眼
3Dｽｺｰﾌﾟ(鏡使用)
赤青メガネ
液晶ｼｬｯﾀｰﾒｶﾞﾈ

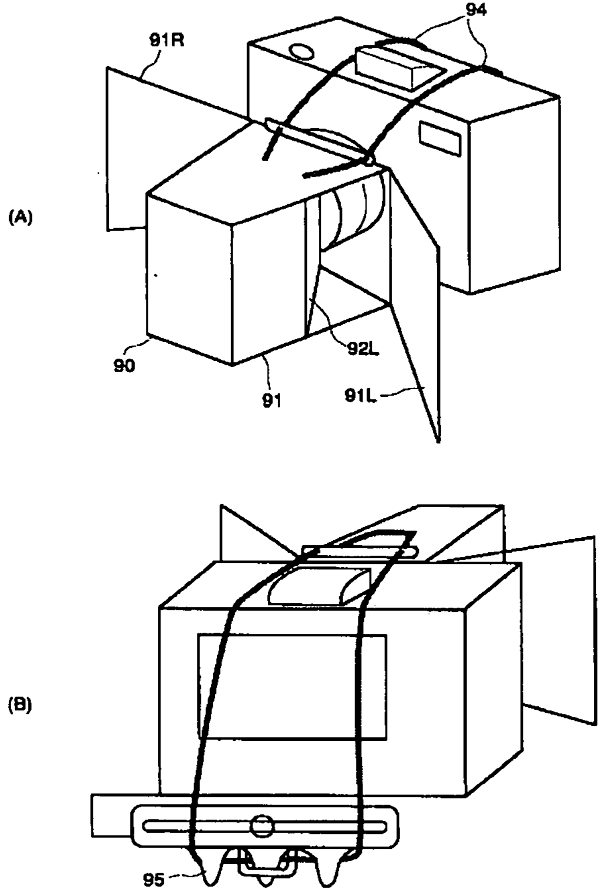
[Drawing 38]


102
103
101
104
105
106
107

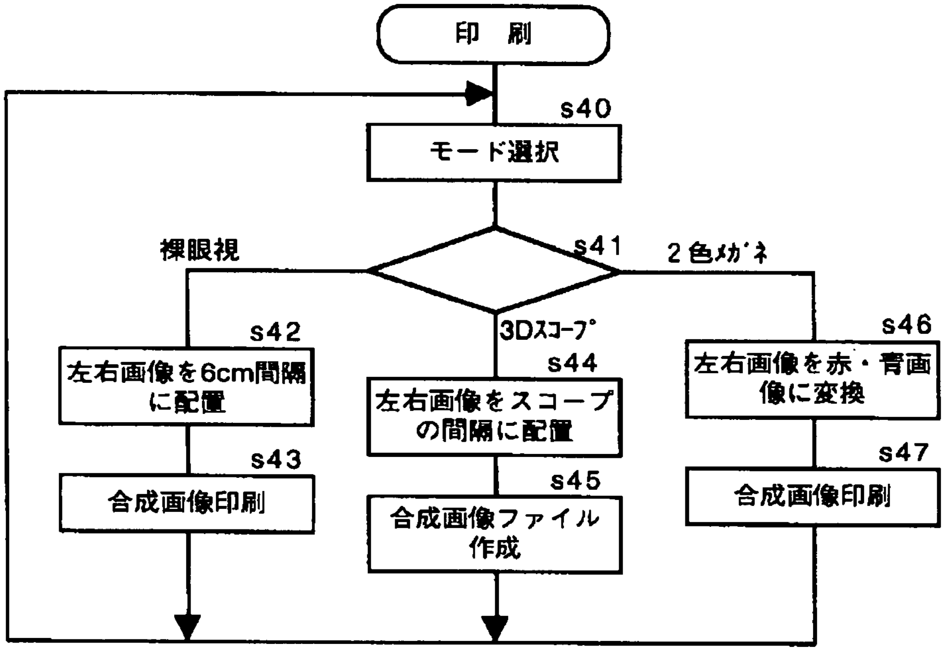
[Drawing 39]


102
放送
103
STB
109
104
105
PC
101
106

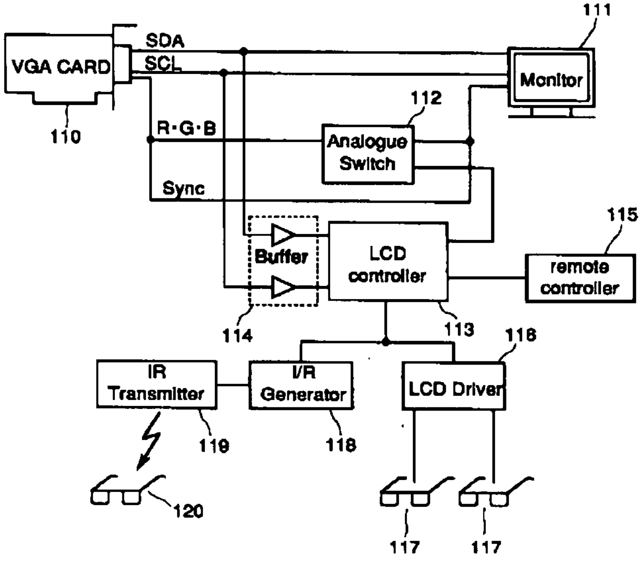
[Drawing 40]


94
91R
(A)
90
92L
91
91L
(B)
95

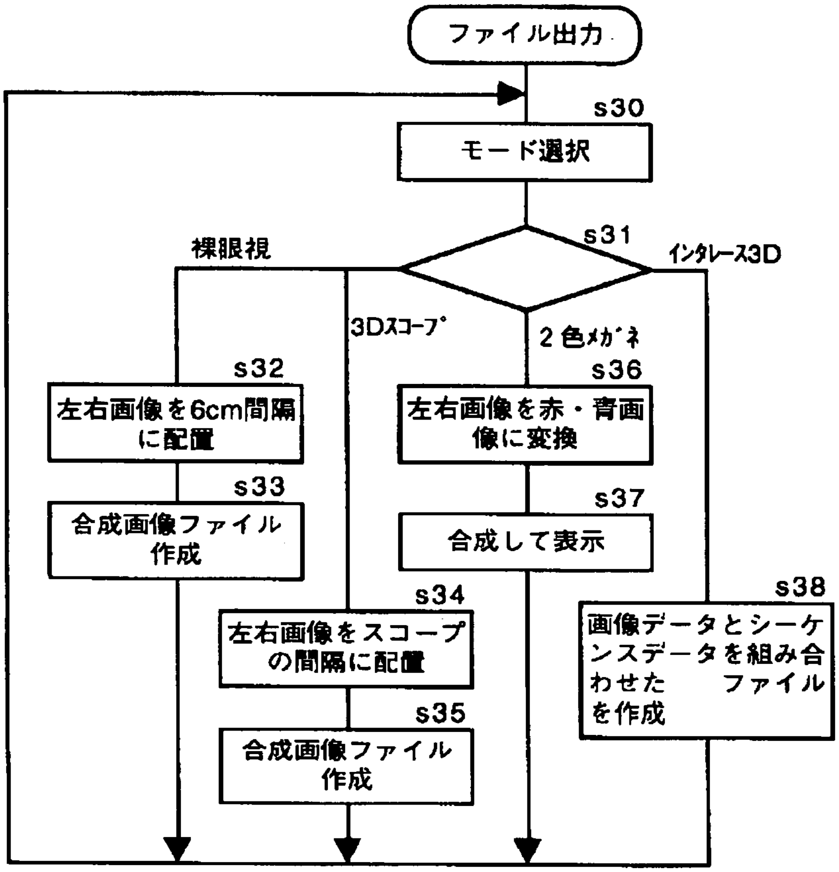
[Drawing 44]


印　刷
s40
モード選択
s41
裸眼視
2色ﾒｶﾞﾈ
3Dｽｺｰﾌﾟ
s42
左右画像を6cm間隔に配置
s43
合成画像印刷
s44
左右画像をスコープの間隔に配置
s45
合成画像ファイル作成
s46
左右画像を赤・青画像に変換
s47
合成画像印刷

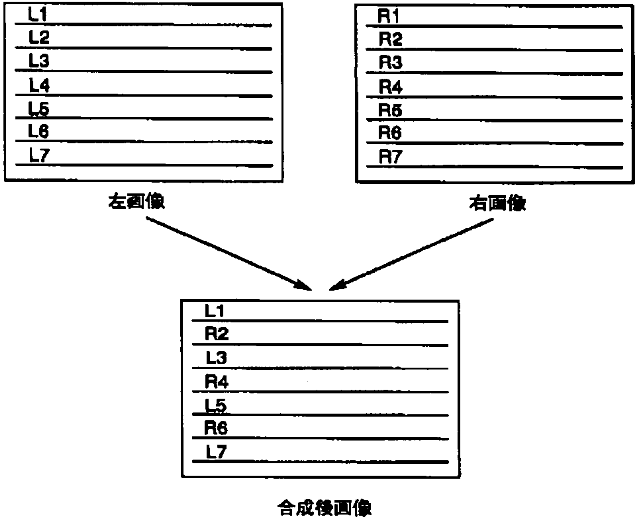
[Drawing 45]


VGA CARD
110
SDA
SCL
R·G·B
Sync
111
Monitor
112
Analogue Switch
Buffer
114
LCD controller
113
115
remote controller
IR Transmitter
119
I/R Generator
118
LCD Driver
116
120
117
117

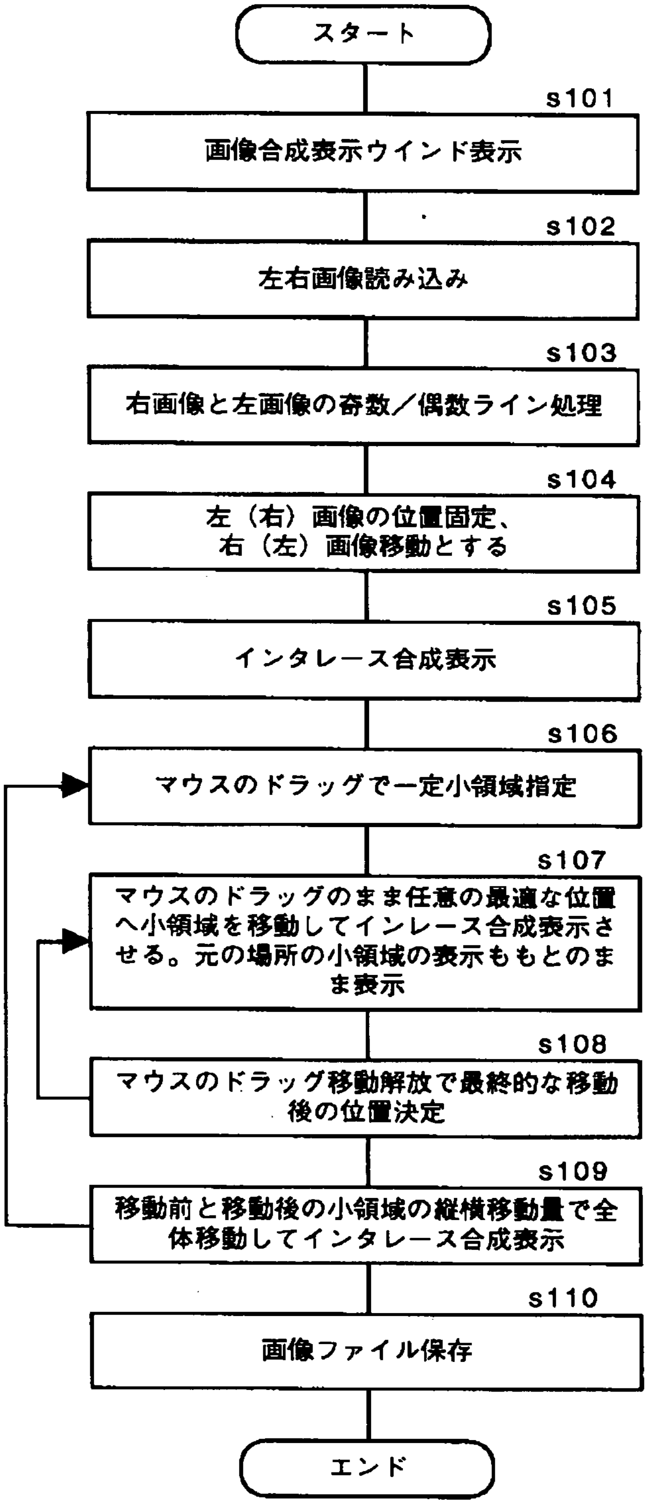
[Drawing 43]


ファイル出力
s30
モード選択
s31
裸眼視
3Dｽｺｰﾌﾟ
2色ﾒｶﾞﾈ
ｲﾝﾀﾚｰｽ3D
s32
左右画像を6cm間隔に配置
s33
合成画像ファイル作成
s34
左右画像をスコープの間隔に配置
s35
合成画像ファイル作成
s36
左右画像を赤・青画像に変換
s37
合成して表示
s38
画像データとシーケンスデータを組み合わせた　ファイルを作成

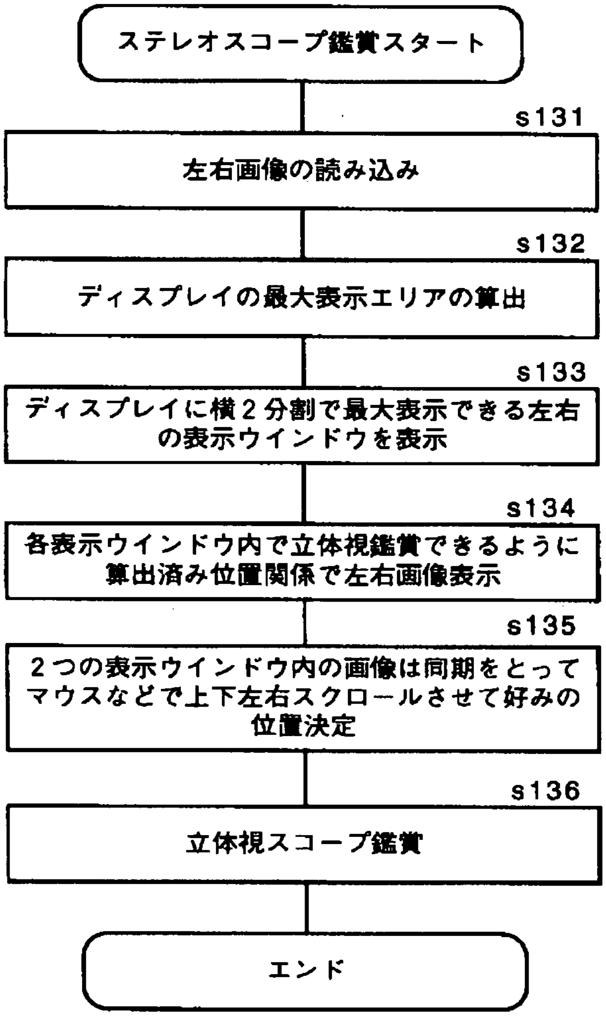
[Drawing 47]


L1
L2
L3
L4
L5
L6
L7
左画像
R1
R2
R3
R4
R5
R6
R7
右画像
L1
R2
L3
R4
L5
R6
L7
合成後画像

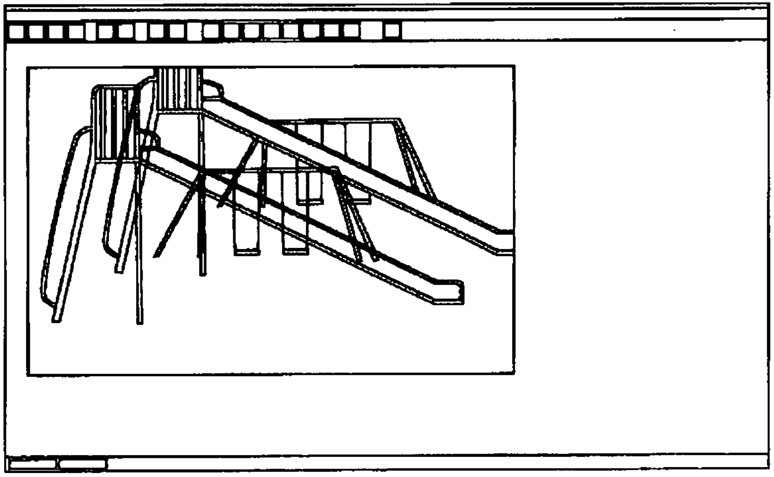
[Drawing 46]


スタート
s101
画像合成表示ウインド表示
s102
左右画像読み込み
s103
右画像と左画像の奇数／偶数ライン処理
s104
左（右）画像の位置固定、
右（左）画像移動とする
s105
インタレース合成表示
s106
マウスのドラッグで一定小領域指定
s107
マウスのドラッグのまま任意の最適な位置へ小領域を移動してインレース合成表示させる。元の場所の小領域の表示ももとのまま表示
s108
マウスのドラッグ移動解放で最終的な移動後の位置決定
s109
移動前と移動後の小領域の縦横移動量で全体移動してインタレース合成表示
s110
画像ファイル保存
エンド

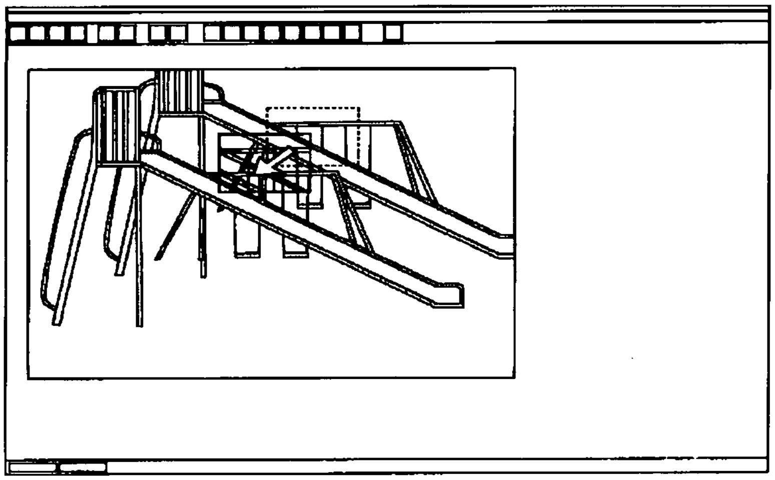
[Drawing 58]


ステレオスコープ鑑賞スタート
s131
左右画像の読み込み
s132
ディスプレイの最大表示エリアの算出
s133
ディスプレイに横２分割で最大表示できる左右の表示ウインドウを表示
s134
各表示ウインドウ内で立体視鑑賞できるように算出済み位置関係で左右画像表示
s135
２つの表示ウインドウ内の画像は同期をとってマウスなどで上下左右スクロールさせて好みの位置決定
s136
立体視スコープ鑑賞
エンド

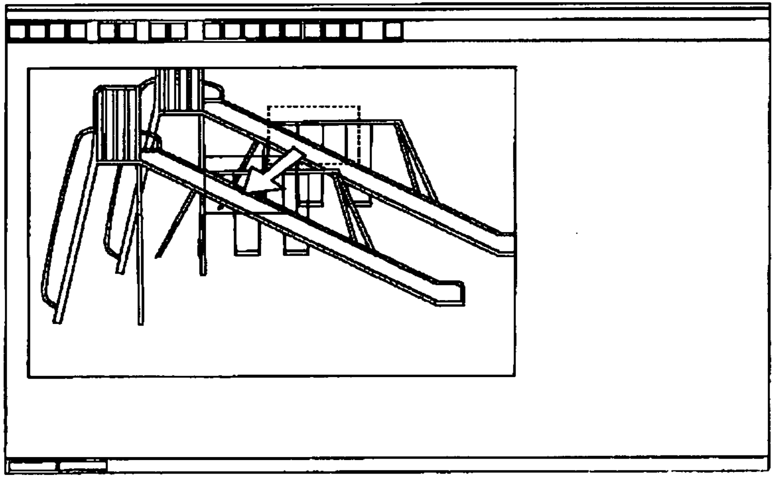
[Drawing 48]



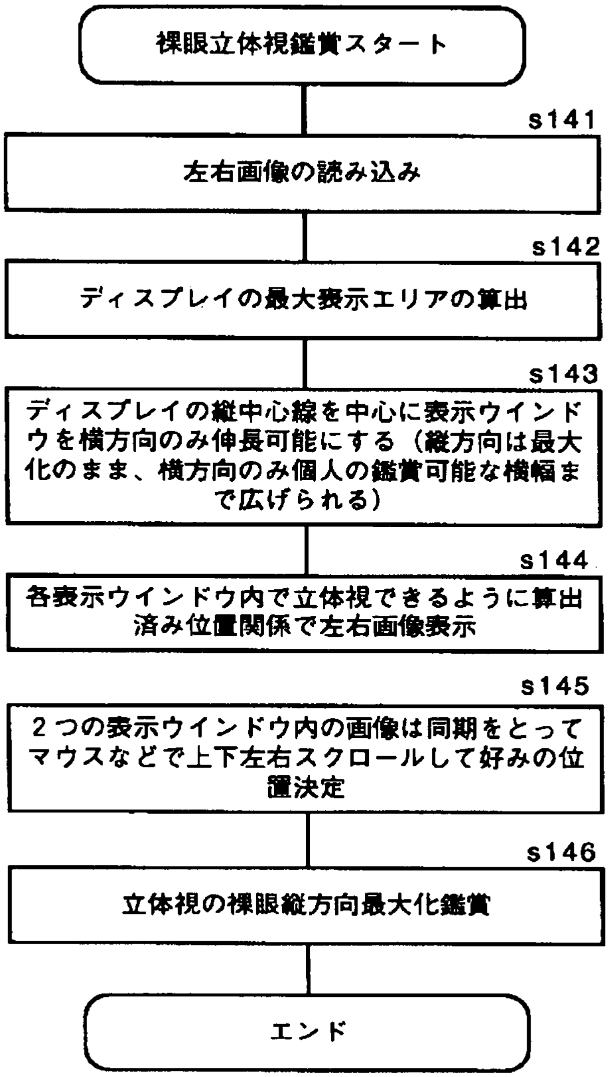
[Drawing 49]



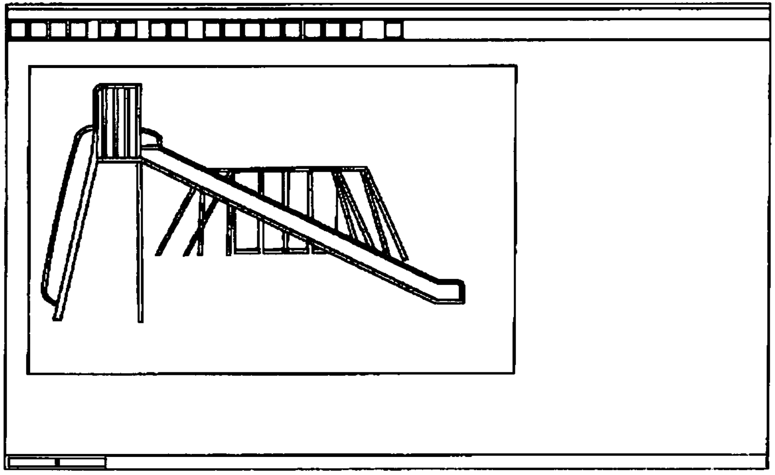
[Drawing 50]



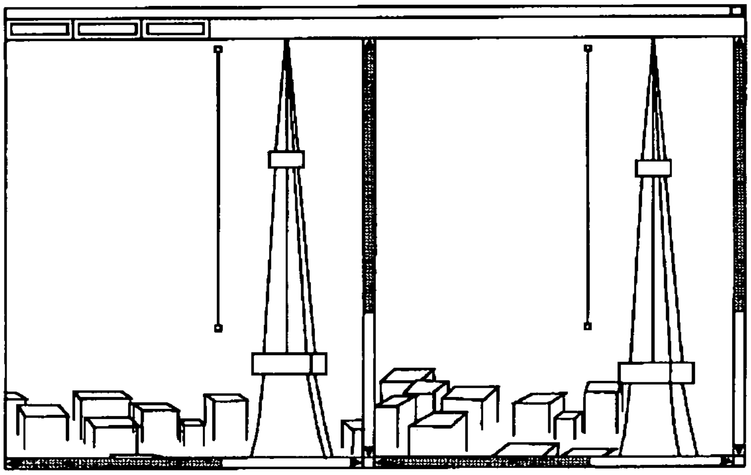
[Drawing 60]


裸眼立体視鑑賞スタート
s141
左右画像の読み込み
s142
ディスプレイの最大表示エリアの算出
s143
ディスプレイの縦中心線を中心に表示ウインドウを横方向のみ伸長可能にする（縦方向は最大化のまま、横方向のみ個人の鑑賞可能な横幅まで広げられる）
s144
各表示ウインドウ内で立体視できるように算出済み位置関係で左右画像表示
s145
２つの表示ウインドウ内の画像は同期をとってマウスなどで上下左右スクロールして好みの位置決定
s146
立体視の裸眼縦方向最大化鑑賞
エンド

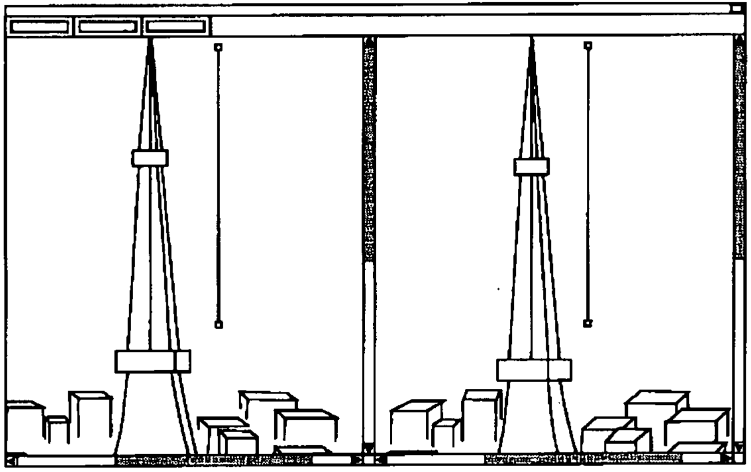
[Drawing 51]



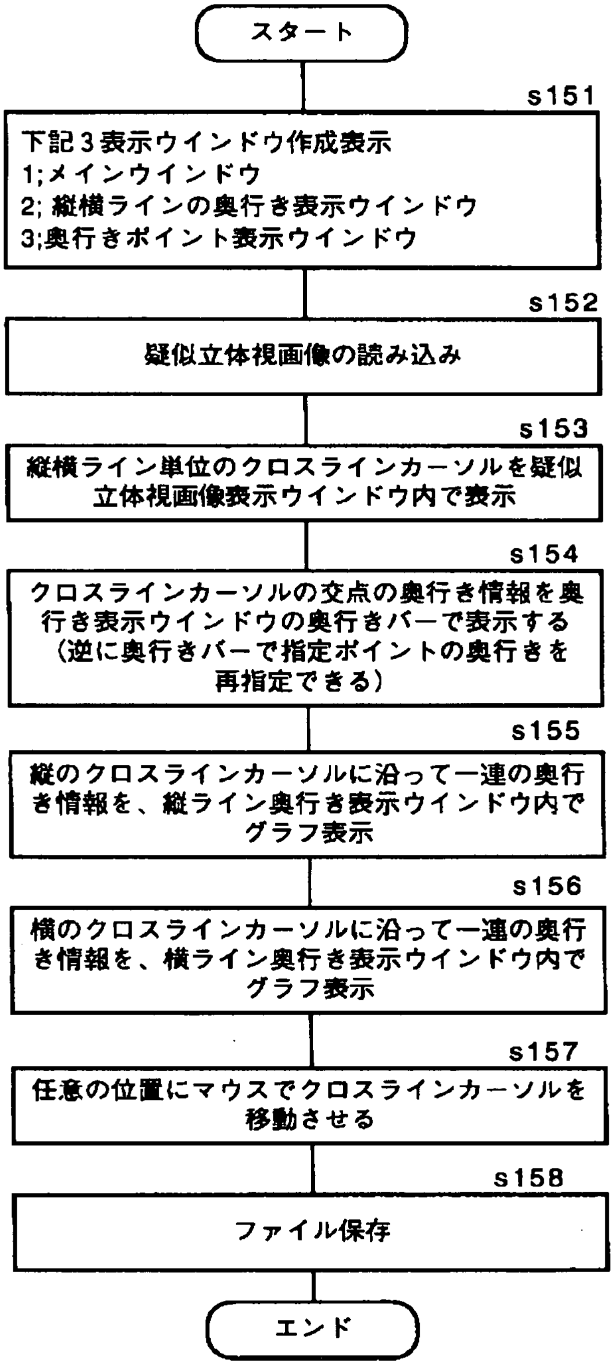
[Drawing 53]



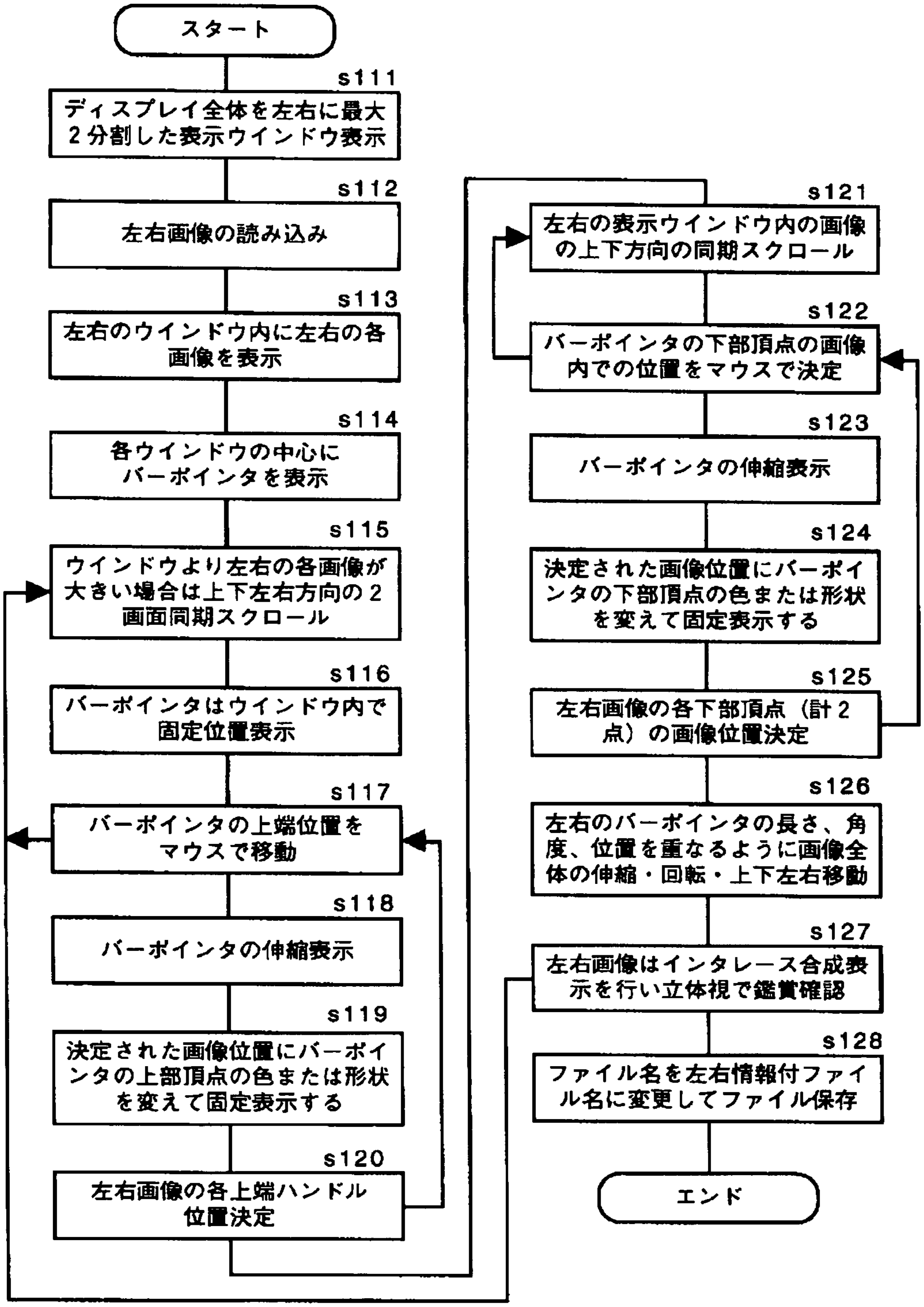
[Drawing 54]



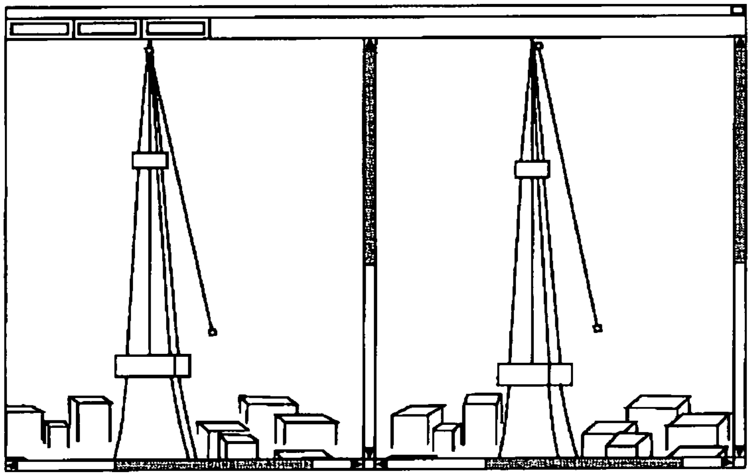
[Drawing 62]


スタート
s151
下記3表示ウインドウ作成表示
1;メインウインドウ
2; 縦横ラインの奥行き表示ウインドウ
3;奥行きポイント表示ウインドウ
s152
疑似立体視画像の読み込み
s153
縦横ライン単位のクロスラインカーソルを疑似立体視画像表示ウインドウ内で表示
s154
クロスラインカーソルの交点の奥行き情報を奥行き表示ウインドウの奥行きバーで表示する（逆に奥行きバーで指定ポイントの奥行きを再指定できる）
s155
縦のクロスラインカーソルに沿って一連の奥行き情報を、縦ライン奥行き表示ウインドウ内でグラフ表示
s156
横のクロスラインカーソルに沿って一連の奥行き情報を、横ライン奥行き表示ウインドウ内でグラフ表示
s157
任意の位置にマウスでクロスラインカーソルを移動させる
s158
ファイル保存
エンド

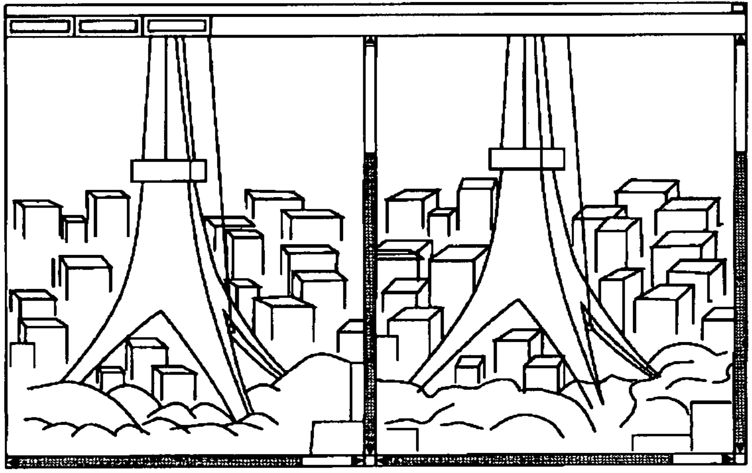
[Drawing 52]


スタート
s111
ディスプレイ全体を左右に最大2分割した表示ウインドウ表示
s112
左右画像の読み込み
s113
左右のウインドウ内に左右の各画像を表示
s114
各ウインドウの中心にバーポインタを表示
s115
ウインドウより左右の各画像が大きい場合は上下左右方向の2画面同期スクロール
s116
バーポインタはウインドウ内で固定位置表示
s117
バーポインタの上端位置をマウスで移動
s118
バーポインタの伸縮表示
s119
決定された画像位置にバーポインタの上部頂点の色または形状を変えて固定表示する
s120
左右画像の各上端ハンドル位置決定
s121
左右の表示ウインドウ内の画像の上下方向の同期スクロール
s122
バーポインタの下部頂点の画像内での位置をマウスで決定
s123
バーポインタの伸縮表示
s124
決定された画像位置にバーポインタの下部頂点の色または形状を変えて固定表示する
s125
左右画像の各下部頂点（計2点）の画像位置決定
s126
左右のバーポインタの長さ、角度、位置を重なるように画像全体の伸縮・回転・上下左右移動
s127
左右画像はインタレース合成表示を行い立体視で鑑賞確認
s128
ファイル名を左右情報付ファイル名に変更してファイル保存
エンド

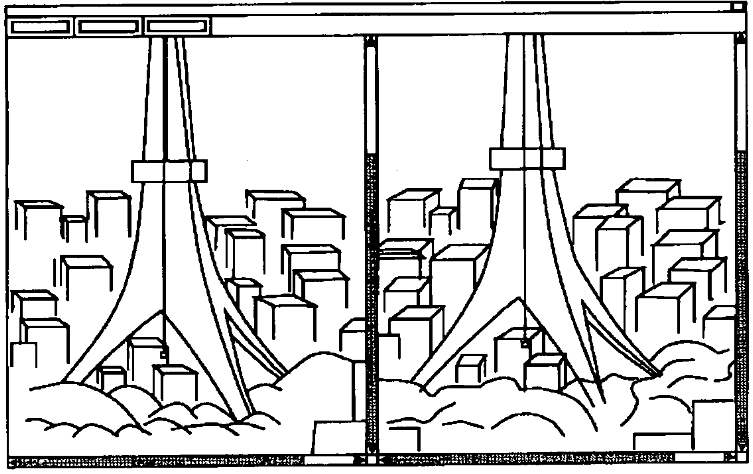
[Drawing 55]



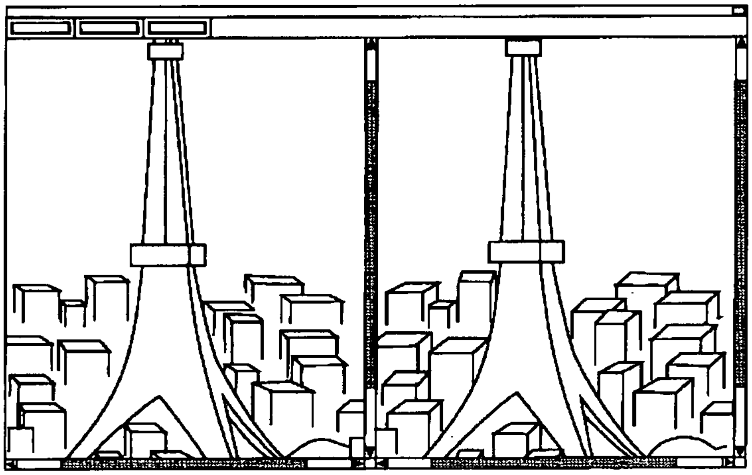
[Drawing 56]



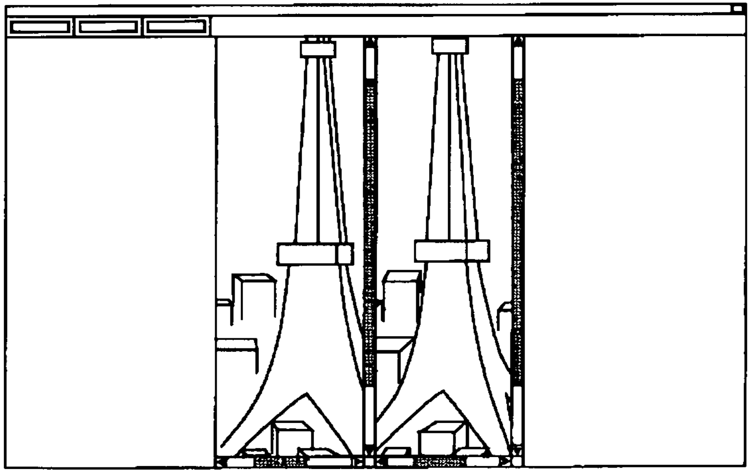
[Drawing 57]



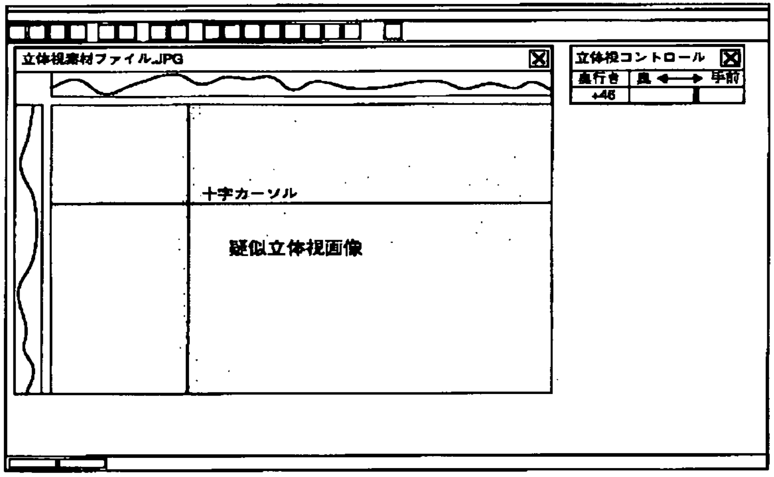
[Drawing 59]



[Drawing 61]



[Drawing 63]


立体視素材ファイル.JPG
立体視コントロール
奥 ←→ 手前
十字カーソル
疑似立体視画像

奥行き +45

[Translation done.]